



# Swisstop®

Swisstop® AIR

Swisstop® KIGO

Swisstop® LILO

Gentle air conditioning: patented solutions  
combining technology, comfort and aesthetics

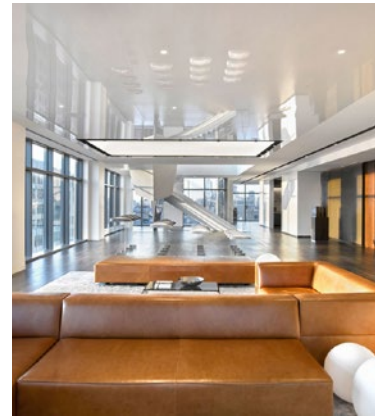


  
SWISS CONFECTION®  
creating design solutions

soltop  
energie 



# Contents



<b>Portrait</b>	<b>2</b>
SWISS CONFECTION	2
SOLTOP Energie	2
Who's it for?	2
For what type of building?	2
<b>Gentle air conditioning: patented solutions combining technology, comfort and aesthetics</b>	<b>3</b>
Standard and optional Swisstop® solutions at a glance	3
<b>Comfort and gentle air conditioning</b>	<b>4</b>
The Swisstop® approach	4
<b>Three Swisstop® solutions</b>	<b>6</b>
Swisstop® AIR – Full surface "air only"	8
Swisstop® KIGO – Full surface "radiation and fresh air"	12
Swisstop® LILO – Ceiling sail "radiation and fresh air"	18
<b>Technical specifications</b>	<b>23</b>
Materials, textures, customisation and built-in components	24
Profiles and installation methods	25
Acoustics	26
Lighting	28
Capacity, temperature, airflow, etc.	32
Scope of services and interfaces	41



# Portrait

## SWISS CONFECTION | Creating Design Solutions

SWISS CONFECTION specialises in **providing solutions in the realms of architecture, interior design and decoration** for buildings in both the private and business sectors. In addition to its **technical office**, our company has its **own production, assembly and installation workshops** for all areas of its activity. Thanks to this structure, we have **unique know-how** at our disposal and can guarantee our clients a perfectly managed project from start to finish.

Our mission is **excellence and innovation**. Guided by an objective approach and a professional strategy, we aim for creative and precise results that are **100% "Swiss Made"**.

*In addition to its gentle air conditioning solutions, SWISS CONFECTION is also a reliable partner for conventional stretch ceilings and walls, acoustic and lighting solutions, bespoke design and high quality printing.*



## SOLTOP ENERGIE

SOLTOP Energie SA (formerly Energie Solaire SA) and Soltop Schuppiser AG have been providing climate comfort and **environmentally friendly heating and cooling systems** in people's homes and places of work since 1973.

Committed to **manufacturing in Switzerland**, the company produces its solar thermal collectors and its ingenious **KIGO climate solutions** exclusively in Switzerland.

SOLTOP Energie SA will soon have you sitting comfortably. Whether it's a new build or renovation project, we will assess your needs and provide you with the **most efficient energy system possible, with no CO<sub>2</sub> emissions**.

*In addition to the air conditioning solutions presented here, SOLTOP Energie is your first choice for renewable energies, including solar energy, solar heating, heat pumps or heating alternatives to gas or oil.*



### Who's it for?



With considerable experience in each of their respective fields, SWISS CONFECTION and SOLTOP Energie have joined forces, pooling their skills for greater efficiency, providing innovative solutions for your comfort under the brand **Swisstop®**.

Swisstop® systems are intended for **architecture practices, HVAC engineers, heating and acoustical engineers as well as technical sales networks or property development**.

### For what type of building?



Swisstop® products are intended for service sector and private buildings. These include **public administration buildings, banks, business premises, hotels, care homes and of course private homes**.

Conscious of its impact on the environment, **Swisstop®** products are suitable for **both new builds and renovation projects**.



# Gentle air conditioning: patented solutions combining technology, comfort and aesthetics

We are well aware of the requirements and expectations arising from a new build or renovation project. **Swisstop®** products fit perfectly into every situation. The products are **adaptable**, can be **customised**, and come in a **large range of finishes** and **variations**. With **Swisstop®**, you can give free rein to your imagination.

The clever combination of gentle air conditioning, hygienic ventilation, sound insulation and lighting, makes **Swisstop®** a solution to meet the highest of expectations



## Standard and optional Swisstop® solutions at a glance

	Swisstop® AIR	Swisstop® KIGO	Swisstop® LILO
Gentle heating	■	■	■
Gentle cooling	■	■	■
Hygienic ventilation	■	■	□
Sound insulation	□	□	■
BASIC lighting	□	□	□
CONFORT lighting	□	□	□
CONFORT+ lighting	□	□	□
Radiation by air	■		
Radiation by KIGO		■	■
Copolymer	■	■	■
Textile	□	□	■
Customisation	□	□	□

■ Standard    □ Optional

# Comfort and gentle air conditioning

Defining a space's optimum comfort is a complex matter as several factors have to be considered at the same time including thermodynamics, acoustics, air quality and flows, and lastly, individual perceptions of the space, influenced by colour and light.

Recent developments in "gentle" air conditioning have led to the invention of systems using temperature levels as close as possible to room temperature to make maximum use of low-temperature infra-red radiation, circulating air around the room at a rate that is barely noticeable in the comfort zone, at the same time considering acoustic aspects. The notion of gentleness refers to the required temperature, which should be as low as possible for heating or as high as possible for cooling. This enables maximum use of renewable energies, **thus reducing the carbon footprint and energy consumption as far as possible.**

By fitting the air conditioning system into the ceiling, walls and floor are left free from obstructions, opening up endless possibilities for the room's interior design.

## The Swisstop® approach

The underlying principle of Swisstop® is to provide a surface on the ceiling that is maintained at a slightly higher temperature than the room in winter and a slightly lower one than the desired temperature in summer. During the heating season this surface radiates heat in all directions to heat up walls, the floor, furniture and occupants. In summer, conversely, it absorbs excess heat, thus cooling occupants.

This radiant ceiling system offers a consistent temperature at ceiling height, unparalleled by other systems. The periphery of this active surface is also used to draw new air into the room and to discreetly remove used air, without causing any perceptible air flow in the comfort zone.

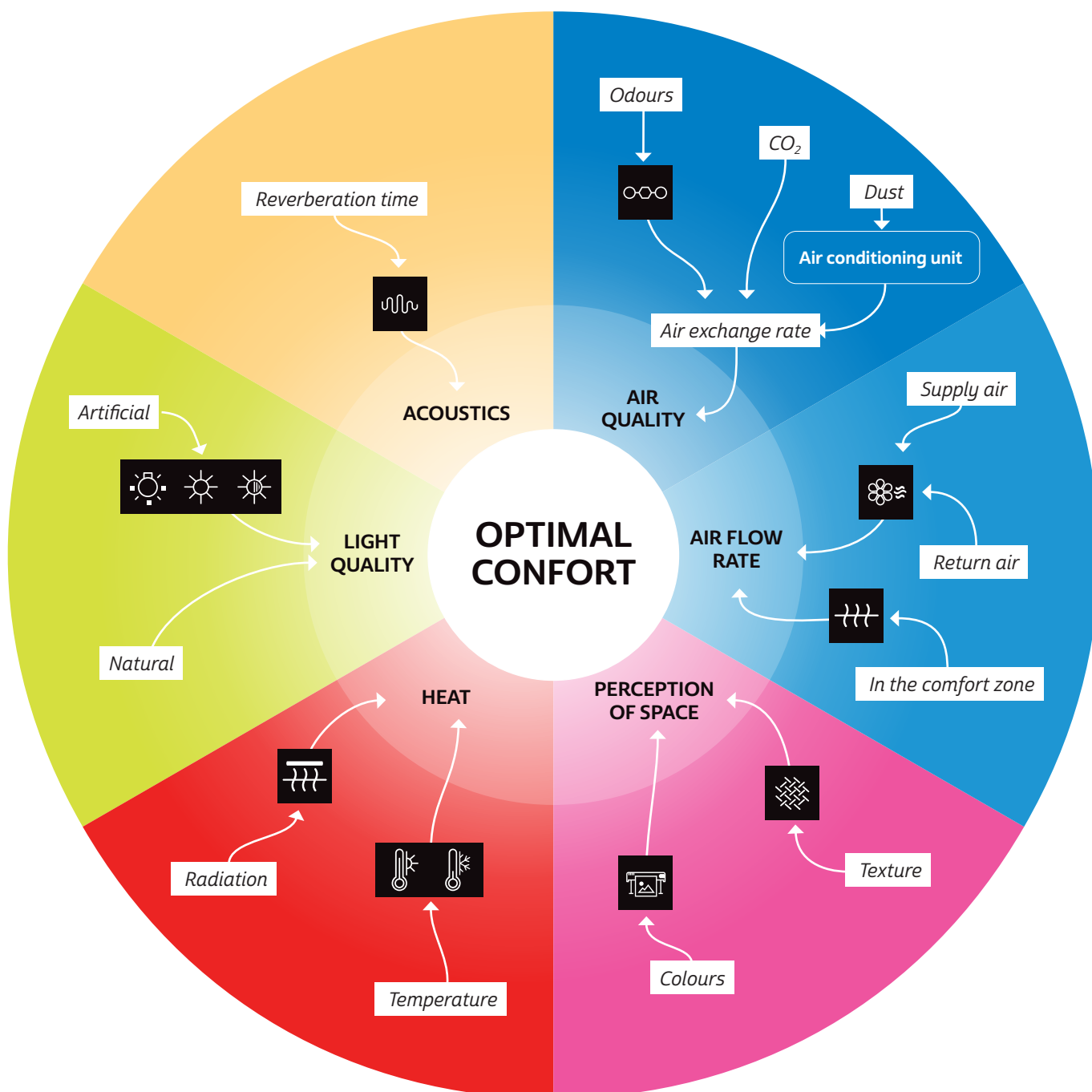
Swisstop® solutions can achieve all this thanks to their components:

- aluminium profiles fixed to the walls hold one or two stretch ceiling elements in place
- between the stretch ceiling and the original ceiling, there is an empty space, known as the plenum, in which it is possible to discreetly install an air conditioning unit, ventilation ducts, KIGO climate panels, pipes, and lighting, etc.
- the stretch ceilings are designed to let through the infra-red heat radiation given off or absorbed by the KIGO climate panels
- the stretch ceilings can be fitted with sound-proofing, meeting the highest acoustic demands
- if lighting is to be included, the stretch ceilings can also be made of translucent material
- stretch ceilings made of copolymer can be taken down and put up again as often as necessary, allowing easy access to the plenum
- the supporting aluminium profiles may be perforated, enabling the silent and imperceptible flow of fresh air and the removal of used air along the walls.



# The Swisstop® approach

Swisstop® solutions consider all the factors that can have an impact on comfort: thermodynamics, acoustics, air quality and flows, and lastly, individual perceptions of the space, influenced by colour and light.



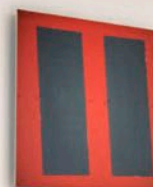


# 3 Swisstop® solutions

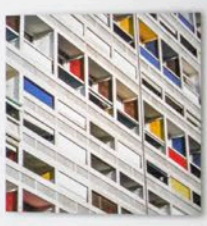
Swisstop® AIR

Swisstop® KIGO

Swisstop® LILO









# Swisstop<sup>®</sup> AIR



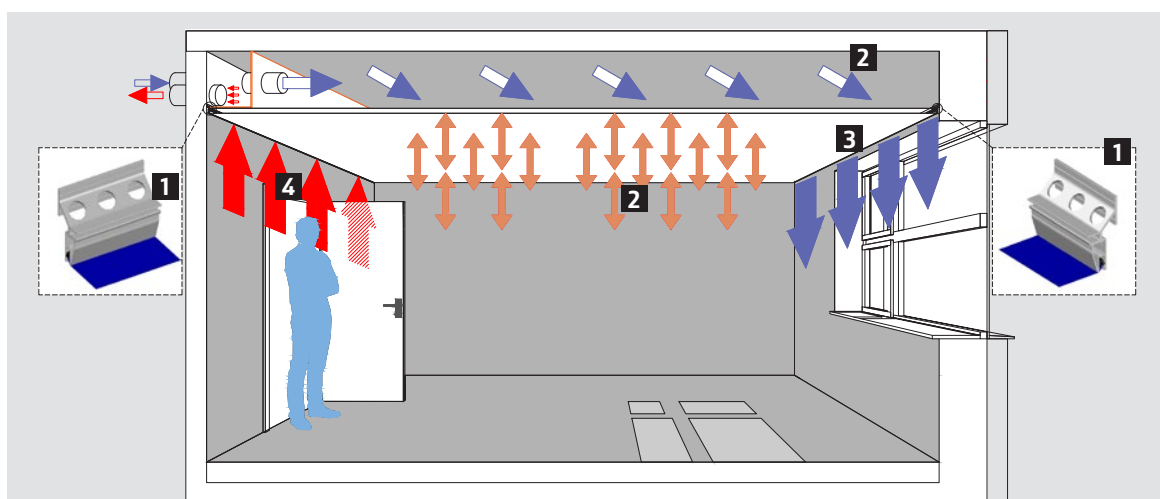


### Principle

First, the air flow required to provide the desired heating output and to remove excess heat into the cooling trap is calculated.

An air conditioning unit and ventilation ducts are connected to the heating and chilled water system. This allows the supply air to reach the correct temperature and to be mixed with fresh air.

At the room's periphery, Swisstop® profiles, some of which are perforated, are mounted to the walls. The optimum profile length is calculated to achieve the best mixture of air in the room without any noticeable air flows in the comfort zone. The stretch ceiling is attached to these profiles. An empty space, the plenum, is created between the stretch ceiling and the actual ceiling. All of the supply air flows into this plenum. The specially designed stretch ceiling maintains its temperature, emitting or absorbing heat, mainly by infra-red radiation and natural convection. Air then flows into the room by means of the perforated profiles. At the other end of the room, air is removed through the perforated profiles into a chamber hidden in the plenum.



#### *Stretch ceiling radiation, supply of fresh air and return of used air.*

- 1** The Swisstop® profiles are mounted at the room's periphery by a fastening method adapted for each project depending on the walls/existing supports. Profiles are either perforated or unperforated. They are strategically positioned depending on the size and shape of the room and location of cold walls (bay windows). This allows the distribution of air to be controlled perfectly and to ensure that the desired temperature is consistent.
- 2** Heat is transferred **by heat radiation** through the stretch ceiling, and by air flowing through the perforated Swisstop® profiles.
- 3** Thanks to the supply of air into the plenum, calculated specifically for each space, the room is heated or cooled at a consistent temperature.
- 4** The mechanical ventilation is perfectly integrated and hidden from view. Air extraction is also ensured by the Swisstop® profile installed at the room's periphery.

The length of each perforated profile is calculated so that the air flow rate is strong enough for air to circulate throughout the room, without however being so strong that it can be heard. The air flow rate is reduced and cannot be felt in the comfort zone which receives air at a very slow rate (less than 0.2 m/s). Last, the air which has been heated (or cooled) arrives at the evacuation vent and returns to the air conditioning unit.

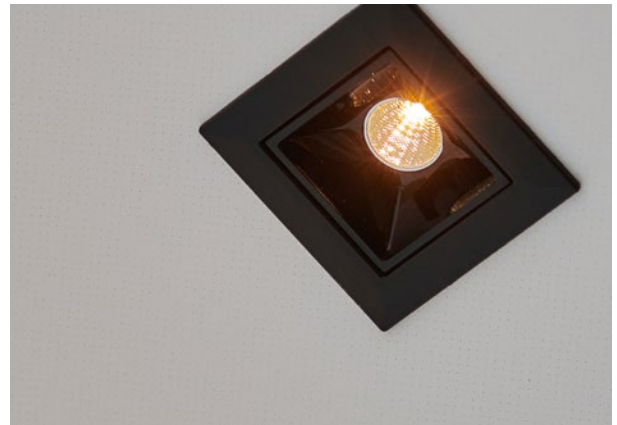
## Technical specifications

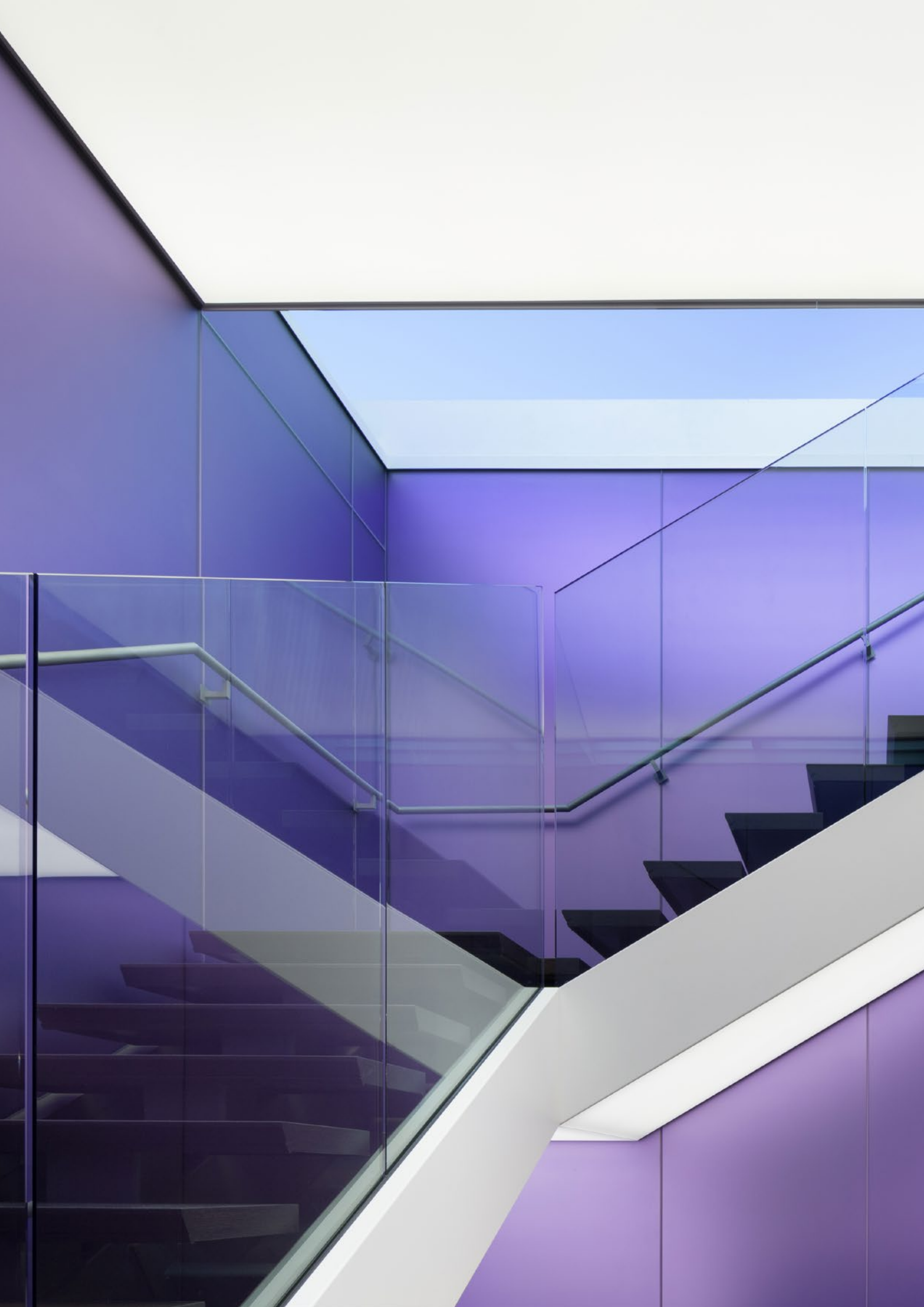


■ Standard    □ Optional

So that it fits seamlessly into the architecture and design of the planned spaces, Swisstop® AIR is available in both a BioPruf copolymer version (detachable and washable) and a textile version.

It is hard to distinguish the Swisstop® solutions from conventionally finished ceilings and they are available in 127 colours, finishes and styles made of the highest quality materials. All the materials used are fully certified, guaranteeing users **complete security**.







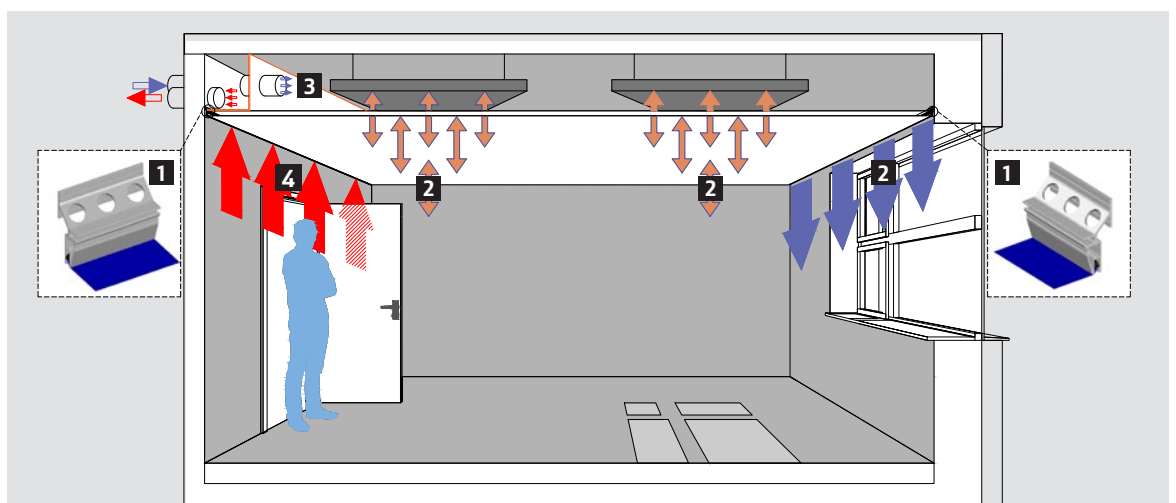
# Swisstop® KIGO



### Principle

In this solution, the heating and cooling output is provided directly by the KIGO climate panels attached to or suspended from the ceiling, within the plenum. Their surface area is determined by the capacity and the supply and return temperatures of the heating and cooling systems to which they are connected.

Most of their capacity is exchanged by heat radiation through the stretch ceiling, the remainder by natural and/or forced convection with air from the plenum. As the temperature of the air in the plenum is different to the room temperature, the stretch ceiling also emits radiant heat and some convection occurs.



*Principle of radiation via the KIGO panels through the stretch ceiling, of the supply and return of new and used air.*

- 1** The Swisstop® profiles are installed at the room's periphery by a fastening method adapted for each project depending on the walls/existing supports. Profiles are either perforated or unperforated. They are strategically positioned depending on the size and shape of the room and location of cold walls (bay windows). This allows the distribution of air to be controlled perfectly and to ensure that the desired temperature is consistent.
- 2** The heated or cooled air passes from the plenum to the room **by heat radiation** through the stretch ceiling, and by air flowing through the perforated Swisstop® profiles.
- 3** Thanks to the supply of new air in the plenum, calculated for each space, the room is heated or cooled at a consistent temperature.
- 4** The mechanical ventilation is perfectly integrated and hidden from view. Air extraction is also ensured by the Swisstop® profile installed at the room's periphery.

In a similar manner to the Swisstop® AIR system, the length of the perforated profiles is calculated so that the airflow supply is strong enough for air to circulate throughout the room, but without being so strong that it can be heard. The profiles are, however, much shorter because the air flow only corresponds to the supply of new air. The flow of air reduces quickly. The heat given off by the occupants and appliances in the room causes the air to be evacuated close to the stretch ceiling. It then arrives at the evacuation vent and returns, via the return chamber, to the ventilation system.

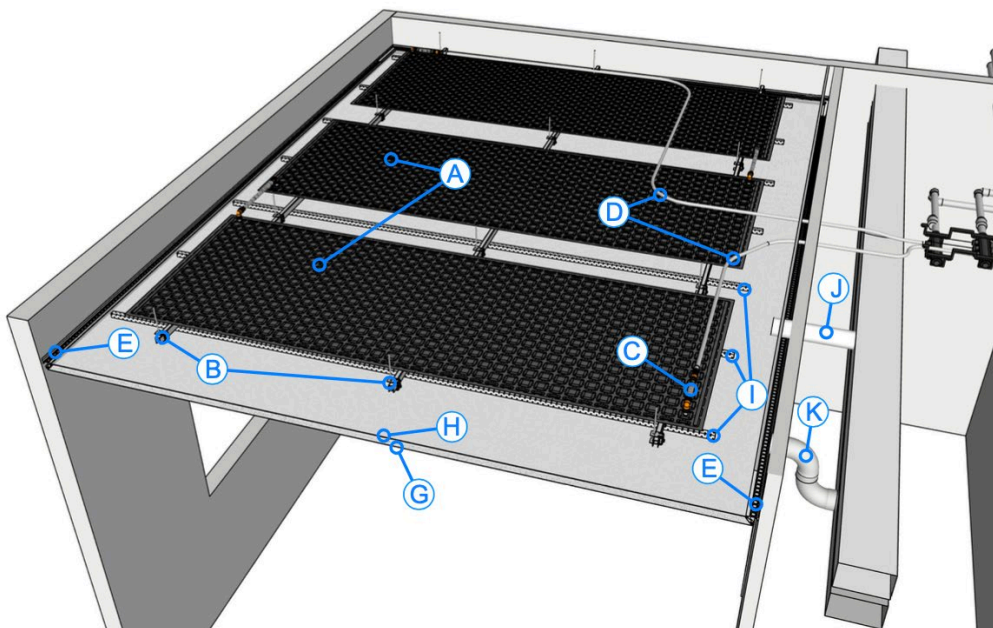
## Technical specifications



■ Standard    □ Optional

So that it fits seamlessly into the architecture and design of the planned spaces, Swisstop® KIGO is available in both a BioPruf copolymer version (detachable and washable) and a textile version.

Swisstop® solutions are hard to distinguish from conventionally finished ceilings and are available in 127 colours, finishes and styles made of the highest quality materials. All the materials used are fully certified, with a guarantee of **complete security** for users.



The KIGO climate panels **A** are installed in the plenum, they can be suspended **B** or attached directly to the ceiling. The hydraulic connectors **C** enable the panels to be grouped together and supplied via the distribution ducts **D**. The flat KIGO heat exchangers hidden behind the stretch ceiling **G** radiate directly through the surface of the stretched ceiling towards people and objects. This is possible due to the thermal permeability of the stretch ceiling.

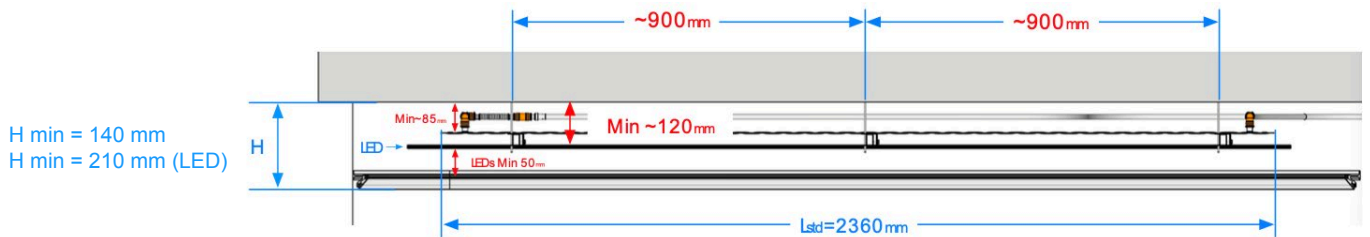
The peripheral Swisstop® profiles **E** have holes enabling air to be exchanged by natural or forced convection **J**, **K** between the plenum and the room, noticeably increasing the cooling capacity.

Thanks to the unique stretch ceiling, transparent to infra-red heat and to the perforated profile, the specific heating and cooling capacities are impressive and unrivalled. Optionally, LEDs **I** can be integrated into the plenum and thanks to a second stretch ceiling **H**, which spreads their light, the entire surface of the ceiling becomes a light fixture.

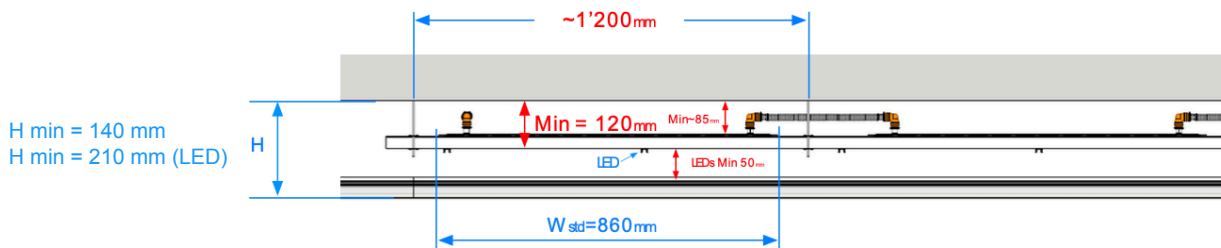
The stretch ceilings can also incorporate a micro-perforated sound absorbing system thus meeting the highest acoustic standards. Depending on the material used for the stretch ceiling, it can be taken down and remounted by a certified installer as often as necessary, for work to be carried out in the plenum.



## Cross-section A - A



## Cross-section B - B



Due to the specific dimensions of the climate panels, 95% of the heat exchange surface is in contact with the water (heat transfer medium), ensuring a very high coefficient of heat transfer and low hydraulic pressure losses. As a result, temperature distribution is uniform over the whole surface.

The stretch ceiling emits heat radiation and ensures optimum distribution of heat and cold.

In cooling mode, the KIGO Swisstop® solution has higher capacity than suspended metal or plasterboard ceilings conventionally used in service sector buildings.











# Swisstop® LILO





# Swisstop® LILO

## Ceiling sail "heat radiation and fresh air"

### Principle

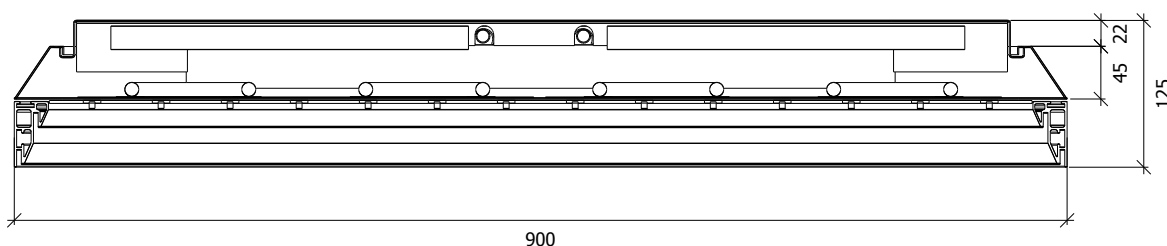
In contrast to the first two solutions, Swisstop® LILO is a modular system. Prefabricated climate ceiling sails combine high-performance KIGO Copper thermal activation, a sound absorber and a frame for the stretch ceiling. They are fixed directly to the ceiling or suspended underneath it.

Optionally, they can also incorporate hygienic ventilation and lighting elements. The size and number of sails depend on the required heat exchange capacity.

Sails are connected to the heating and chilled water system and where fitted to the ventilation system providing renewed fresh air, or to the 230 V mains supply for the lighting option.



With its understated and bespoke design, the standard LILO model is **900 mm** wide and **2400 mm** long and with a height of only **125 mm**, is extremely slender and unobtrusive.



*Both the format and the finishes of Swisstop® LILO can be customised to meet your specific installation requirements.*

## Technical specifications



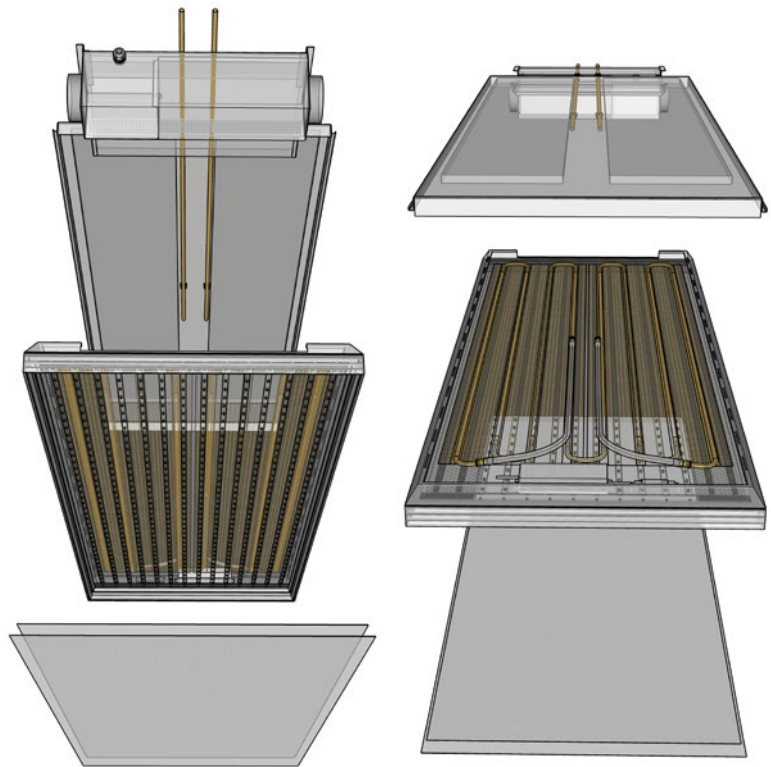
■ Standard    □ Optional

Up to three elements can be placed next to each other to form a longer sail for integrated hygienic ventilation with a distribution capacity of 100 m<sup>3</sup>/h. If this option is not chosen, the sails can be arranged as wished.

Technical parts can be accessed easily as the lower panel unhooks and swings down without the need for tools. The stretch ceiling can be taken down and remounted by a qualified fitter.

LILO is made up of various components:

- A steel support is suspended from or attached to the ceiling. This part is assembled at the same time as the connection ducts and the ventilation chamber. This allows access to other services for the distribution of the various heating and cooling fluids. The sound absorber is fitted to the underside of the support.
- A perforated metal tile is hooked onto the support and can swing down without needing tools. This houses the factory-installed KIGO Copper activation. This comprises a patented perforated copper sheet to which a copper tube has been laser-welded. For the lighting option, LEDs are fitted underneath the metal tile while power components (converter and electronic controls) are placed in the tile. An aluminium frame, also fixed to the metal tile in the factory, allows one or two stretch ceilings to be attached.
- The stretch ceilings are fitted at the end of the project once all technical tests have been conducted successfully.

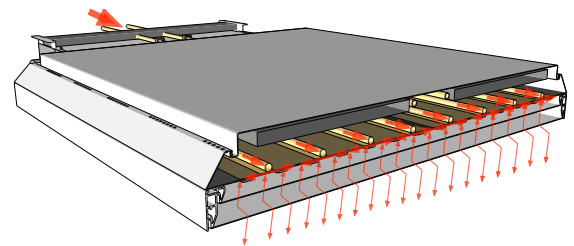


LILO has a high level of acoustic performance (aW 0.90), by combining a micro-perforated stretch ceiling, a perforated metal tile with acoustic fleece, and as an option, an internal sound absorber. The KIGO Copper activation transmits high-capacity heat transfer while maintaining the acoustic properties of the perforated tile.

## Capacity

The KIGO Copper activation, which covers more than 75% of the LILO's surface, heats or cools the metal tile. This radiates through the stretch ceiling, evacuating some of the heat generated by lighting, if fitted.

The temperature of the fresh air supplied through the chamber in the space between the support and the activation tile is also cooled or heated slightly, thus increasing capacity.



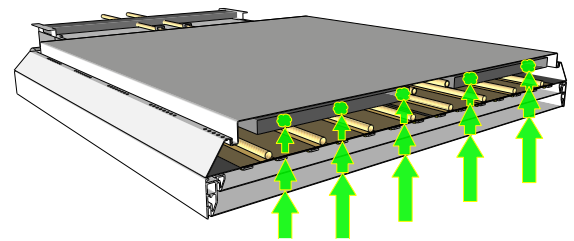
**The reference output per m<sup>2</sup> of ceiling sail with a supply of 100 m<sup>3</sup>/h in LILO at a neutral temperature (equal to room temperature) is:**

<b>Cooling</b>	96 W/m <sup>2</sup> with supply and return temperature of 16-19°C and room temperature of 26°C i.e. a $\Delta T_m$ of 8.5 K
<b>Heating</b>	96 W/m <sup>2</sup> with supply and return temperature of 33-30°C and room temperature of 21°C i.e. a $\Delta T_m$ of 10.5 K

Without ventilation, capacity is reduced by 20% for cooling and 30% for heating.

## Acoustics

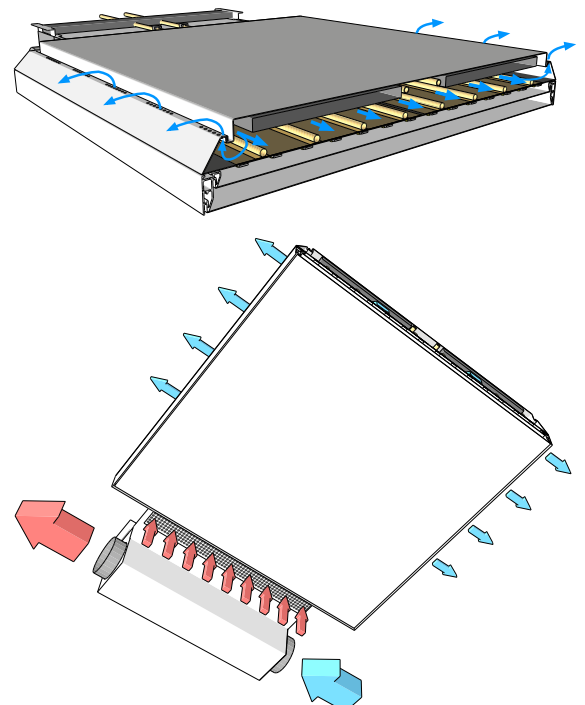
The acoustic pressure wave is partially absorbed when it crosses the micro-perforated stretch ceilings. This reduced wave is again partly absorbed by the perforated tile and its acoustic fleece. The remainder reaches the plenum where it is dispersed by the sound absorber, preventing its reverberation from the metal support.



## Ventilation

Fresh air is supplied to the LILO plenum by a ventilation chamber. It has a capacity of 100 m<sup>3</sup>/h. Air reaches the perforations hidden on the top of the metal tile and located along the tile's long sides. The uniform air flow is sufficient to allow it to mix silently and imperceptibly with the air in the room.

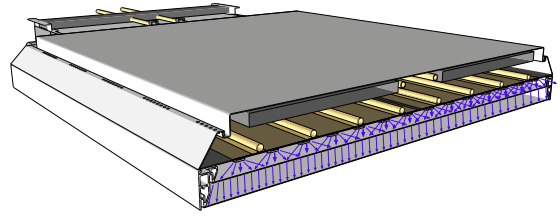
The return air is extracted through gratings in the technical space or through the LILO double-flow chamber. With a capacity of 100 m<sup>3</sup>/h, this chamber has a cuff for fresh air and one for extracted air which is drawn from the room between the technical space and the ceiling sail.





## Lighting

A circuit of "cold" and "warm" white LED light can be produced across the entire light spectrum. The surface of the tile and the LED circuit are white, spreading some of the light. The first stretch ceiling fragments the light so that the position of the light source cannot be seen and the light is diffused evenly over the entire surface of the second stretch ceiling.



# Technical specifications





## Materials, textures, customisation and built-in components

### Technical features of the stretch ceilings

So that they fit perfectly into the architecture and design of the planned spaces, Swisstop® proposes **two types of finishes**:

**BioPruf copolymer** can be removed and remounted, has a wipeable or washable coating

**Textile** unsuitable for removal and remounting, light maintenance of coating possible

The laminated BioPruf copolymer finish is a multi-purpose solution, is easy to look after and long-lasting. The textile version has a woven, more authentic finishing.

Swisstop® solutions are hard to tell apart from conventionally finished ceilings and are available in **127 colours, finishes and styles** made of the highest quality materials. All the materials used are fully certified, guaranteeing users **complete security**.

<b>Marking</b>	CE
<b>Fire protection classification</b>	Bs 1 d0, Bs 2 d0, M0, non-toxic, no CFC or HCFC emission, certified A
<b>Indoor air pollution classification</b>	A+
<b>Recyclable</b>	entirely, 100%

### Bespoke ceiling sails/coatings

Thanks to its wide range of finishings, Swisstop® is suitable for any project, no matter how demanding or specialised it may be. This is because all of its coatings can be tailored to suit different interiors and requirements.

Whether your heart is set on a blue sky for your office or simply exposed concrete, our stretch ceilings won't disappoint. This is possible due to a high quality and environmentally friendly UHD (ultra-high definition) printing process.

The customised coatings can be combined with our lighting solutions, lending a third dimension to the chosen theme by means of light. The only limit is your own imagination.

### Built-in components

All of the components present on a conventional ceiling are housed in the Swisstop® AIR et KIGO products, i.e.:

- spotlights / recessed or non-recessed lights
- motion or fire detectors
- emergency exit signs
- linear lighting / LED strip lights
- other technical components included in the project

Manual or motorised inspection hatches, in standard or customised size, are available to access technical parts in the plenum.

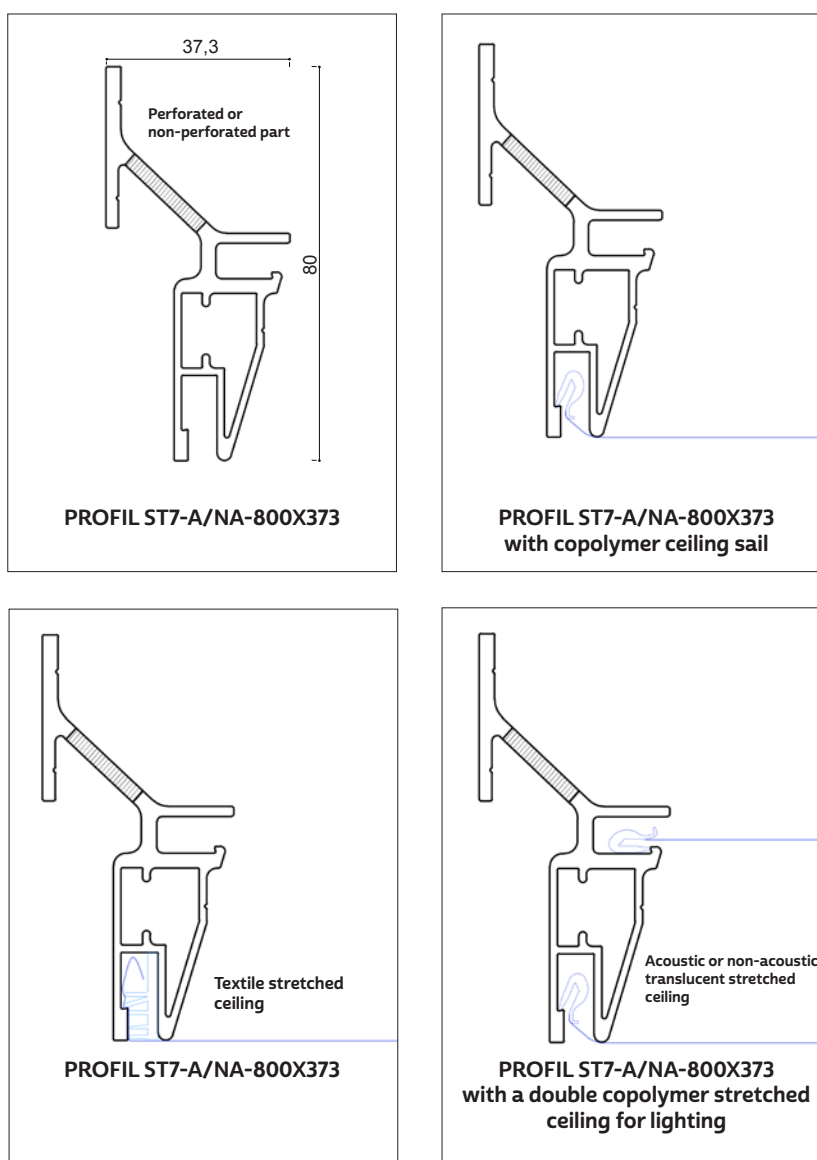




## Profiles and installation methods

### Profiles

Perforated profile reference	ST7-A
Non-perforated profile reference	ST7-NA
Profile colour	by powder coating, RAL 9016 (other RAL or NCS available as an option)



### Installation method

The use of profiles around the periphery of the room ensures a precise fit in the corners and with the connectors. As the aluminium profile allows two stretch ceilings to be incorporated at the same time (version with lighting), depending on the stretch ceiling version chosen, it is possible to completely dismantle it. The aluminium profile consists of a single piece and is both shape-retaining and shear-resistant. The quality fittings and accessories ensure that the installation is fully reliable. Mechanical fitting at the periphery guarantees tensile stability of 3.5 N.



# Acoustics

All of the Swisstop® solutions have high performance acoustic properties able to reach noise reductions of: (NRC = 1.0 / Class A).

For a standard stretch ceiling or a double stretch ceiling for backlit solutions, sound absorption will thus be determined by:

- the type of acoustic stretch ceiling chosen as well as its air permeability properties (kPa s/m<sup>2</sup>)
- the plenum depth
- the presence of a sound absorber in the plenum.

The sound absorption rate is determined by tests conducted in accordance with the ASTM C423 standard. Results are given in NRC.

**Below are three examples of acoustic tests conducted with different configurations.**

*If your configuration is not shown, please ask us so that we can provide you with the relevant results.*

## Test 1

1 acoustic stretch ceiling tested with different plenum depths and different sound absorbers.

Freq. Hz	PLENUM DEPTH OF 100 MM			PLENUM DEPTH OF 150 MM			PLENUM DEPTH OF 200 MM		
	Positioning of insulation			Positioning of insulation			Positioning of insulation		
	No insulaton	Fibre glass: 25 m, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>	No insulaton	Fibre glass: 25 mm, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>	No insulaton	Fibre glass: 25 mm, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>
Absorption coefficient			Absorption coefficient			Absorption coefficient			
50	-0.08	0.11	0.09	-0.08	0.01	-0.03	0.07	-0.05	-0.29
63	0.20	0.18	0.24	0.24	0.17	0.12	0.13	0.15	0.12
80	0.33	0.28	0.30	0.18	0.29	0.18	0.15	0.27	0.12
100	0.49	0.60	0.56	0.57	0.46	0.68	0.18	0.26	0.36
125	0.23	0.32	0.45	0.54	0.62	0.73	0.33	0.47	0.54
160	0.40	0.45	0.60	0.66	0.75	0.92	0.57	0.68	0.96
200	0.31	0.47	0.71	0.57	0.72	1.00	0.49	0.66	0.96
250	0.30	0.55	0.95	0.47	0.69	1.02	0.50	0.74	1.00
315	0.41	0.74	0.99	0.50	0.69	0.86	0.44	0.58	0.74
400	0.52	0.85	0.99	0.52	0.74	0.87	0.42	0.63	0.72
500	0.55	0.80	0.83	0.46	0.64	0.70	0.37	0.49	0.58
630	0.55	0.76	0.78	0.47	0.61	0.69	0.38	0.50	0.59
800	0.55	0.66	0.71	0.45	0.55	0.64	0.38	0.51	0.60
1000	0.51	0.61	0.67	0.44	0.59	0.64	0.48	0.63	0.65
1250	0.44	0.54	0.62	0.41	0.57	0.58	0.48	0.60	0.61
1600	0.37	0.52	0.57	0.44	0.58	0.58	0.45	0.55	0.57
2000	0.42	0.55	0.54	0.44	0.57	0.57	0.44	0.54	0.55
2500	0.43	0.55	0.51	0.41	0.53	0.54	0.42	0.49	0.52
3150	0.38	0.51	0.47	0.40	0.48	0.46	0.40	0.45	0.47
4000	0.33	0.46	0.39	0.35	0.41	0.39	0.38	0.38	0.43
5000	0.27	0.44	0.35	0.31	0.35	0.33	0.35	0.36	0.39
6300	0.23	0.44	0.29	0.25	0.30	0.22	0.30	0.25	0.36
8000	0.12	0.41	0.18	0.19	0.20	0.14	0.28	0.19	0.31
10000	0.01	0.43	0.01	0.03	0.05	-0.03	0.23	0.04	0.22
<b>NRC<sup>1</sup></b>	<b>0.45</b>	<b>0.65</b>	<b>0.75</b>	<b>0.45</b>	<b>0.60</b>	<b>0.75</b>	<b>0.45</b>	<b>0.60</b>	<b>0.70</b>
<b>SAA<sup>2</sup></b>	<b>0.45</b>	<b>0.63</b>	<b>0.74</b>	<b>0.47</b>	<b>0.62</b>	<b>0.72</b>	<b>0.44</b>	<b>0.58</b>	<b>0.67</b>
<b>Test conditions<sup>3</sup></b>									
Temp.	21.3/22.7 C°	21.9/22.5 C°	21.3/22.7 C°	21.3/23.3 C°	21.3/23.06 C°	21.3/23.06 C°	21.3/22.2 C°	21.3/22.2 C°	21.3/23.06 C°
Humid.	57/61%	59/65%	57/61%	57/60%	57/60%	57/58%	57/57%	57/61%	57/55%
BP	30.5/30.48%	30.48/30.48%	30.5/30.48%	30.5/30.7%	30.5/30.7%	30.5/30.7%	30.5/30.5%	30.5/30.48%	30.5/30.5%

<sup>1</sup> Noise reduction coefficient, NRC, according to ASTM C423.

<sup>2</sup> Sound absorption coefficient, SAA, according to ASTM C423.

<sup>3</sup> The test conditions cited were those present during the measurement of the empty room and during the measurement of the sample respectively. (e.g., "room temperature in empty room / room with sample temperature").



**Test 2**

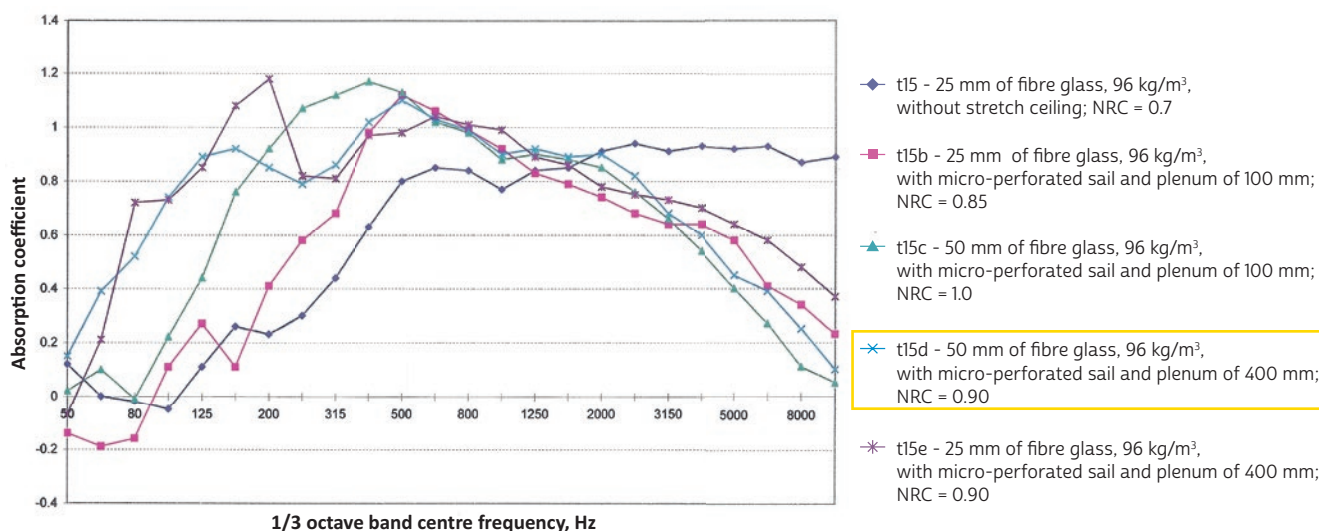
2 acoustic stretch ceilings spaced 50 mm apart and tested with different plenum depths and different sound absorbers.

Freq. Hz	PLENUM DEPTH OF 100 MM			PLENUM DEPTH OF 150 MM			PLENUM DEPTH OF 200 MM		
	Positioning of insulation			Positioning of insulation			Positioning of insulation		
	No insulaton	Fibre glass: 25 mm, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>	No insulaton	Fibre glass: 25 mm, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>	No insulaton	Fibre glass: 25 mm, 96 kg/m <sup>3</sup>	Fibre glass: 50 mm, 48 kg/m <sup>3</sup>
Absorption coefficient									
50	-0.03	0.13	0.08	0.21	-0.07	0.09	0.14	-0.14	0.04
63	0.29	0.19	0.19	0.04	0.17	0.20	0.10	0.13	0.32
80	0.21	0.26	0.29	0.28	0.27	0.30	0.24	0.27	0.21
100	0.63	0.46	0.63	0.56	0.62	0.70	0.24	0.28	0.42
125	0.31	0.33	0.39	0.67	0.63	0.77	0.36	0.51	0.69
160	0.43	0.44	0.68	0.74	0.87	0.99	0.80	0.90	1.19
200	0.36	0.42	0.87	0.71	0.85	1.09	0.62	0.76	1.06
250	0.38	0.64	1.00	0.61	0.83	1.05	0.56	0.79	0.91
315	0.51	0.84	0.98	0.65	0.74	0.85	0.50	0.58	0.67
400	0.66	0.95	0.93	0.60	0.77	0.80	0.49	0.61	0.60
500	0.62	0.77	0.78	0.51	0.60	0.65	0.42	0.48	0.55
630	0.62	0.72	0.73	0.51	0.59	0.65	0.45	0.52	0.58
800	0.63	0.67	0.72	0.54	0.62	0.68	0.53	0.62	0.66
1000	0.70	0.72	0.77	0.69	0.73	0.77	0.67	0.74	0.76
1250	0.73	0.74	0.76	0.71	0.77	0.77	0.69	0.73	0.75
1600	0.64	0.65	0.66	0.64	0.67	0.67	0.63	0.66	0.65
2000	0.57	0.57	0.58	0.55	0.58	0.57	0.55	0.58	0.57
2500	0.48	0.48	0.48	0.50	0.50	0.49	0.48	0.49	0.48
3150	0.40	0.42	0.42	0.44	0.42	0.42	0.42	0.43	0.43
4000	0.36	0.36	0.36	0.40	0.36	0.36	0.38	0.39	0.40
5000	0.33	0.33	0.33	0.41	0.34	0.35	0.38	0.39	0.39
6300	0.26	0.26	0.26	0.40	0.22	0.27	0.32	0.32	0.37
8000	0.20	0.20	0.17	0.36	0.12	0.21	0.32	0.32	0.36
10000	-0.02	-0.02	0.05	0.38	-0.02	0.07	0.23	0.23	0.30
<b>NRC</b>	<b>0.55</b>	<b>0.70</b>	<b>0.80</b>	<b>0.60</b>	<b>0.70</b>	<b>0.75</b>	<b>0.55</b>	<b>0.65</b>	<b>0.70</b>
<b>SAA</b>	<b>0.57</b>	<b>0.68</b>	<b>0.77</b>	<b>0.60</b>	<b>0.69</b>	<b>0.75</b>	<b>0.55</b>	<b>0.63</b>	<b>0.69</b>
Test conditions <sup>3</sup>									
Temp.	21.3/23.06 C°	21.3/23.06 C°	21.3/23.06 C°	21.9/22.2 C°	21,3/22.2 C°	21,3/22.7 C°	21,3/22.2 C°	21,3/22.2 C°	21,3/23.06 C°
Humid.	57/60%	57/60%	57/60%	59/63%	57/61%	57/61%	57/57%	57/57%	57/56%
BP	30.5/30.48%	30.5/30.48%	30.5/30.48%	30.48/30.7%	30.5/30.7%	30.5/30.7%	30.5/30.5%	30.5/30.5%	30.5/30.5%

<sup>1</sup> Noise reduction coefficient, NRC, according to ASTM C423.  
<sup>2</sup> Sound absorption coefficient, SAA, according to ASTM C423.  
<sup>3</sup> The test conditions cited were those present during the measurement of the empty room and during the measurement of the sample respectively, (e.g., "room temperature in empty room / room with sample temperature").

**Test 3**

Different absorption curves of micro-perforated stretch ceilings with different plenums and sound absorbers.







# Lighting

In addition to their initial air conditioning, acoustic and hygienic properties, all Swisstop® solutions can incorporate a lighting solution too. Lighting solutions use translucent stretch ceilings to create a luminous surface that ensures the **completely uniform and harmonious** distribution of light.

Like all Swisstop® solutions, our lighting products are of high quality, efficient and durable. The copolymer version consists of two stretch ceilings. These are completely sealed, ensuring that any dust or insects, etc., cannot be seen through the luminous flux.

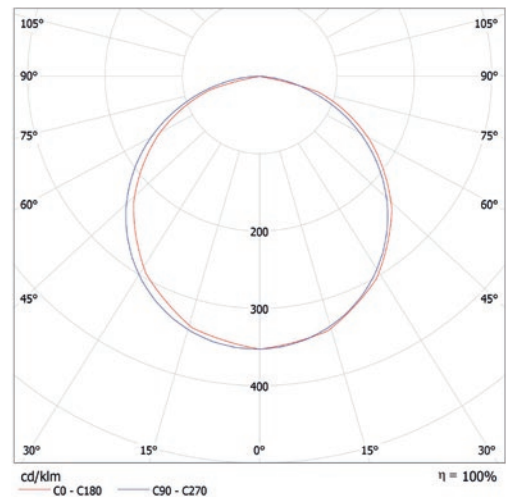
There are various options for translucent stretch ceilings whose colour and transmission rate vary depending on the site's structural constraints and the illumination levels required.

You can find four examples of Swisstop® photometric curves on page 30.

*As each project has its specific requirements and expectations, we are here to assist and advise you as well as providing you with the appropriate lighting tests.*

**Technical data**

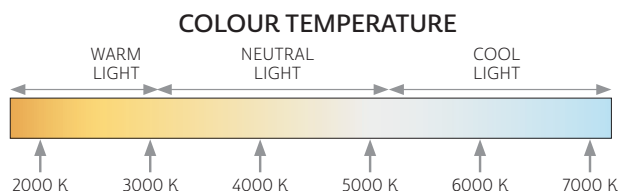
Usage:	intense use
Nominal voltage:	200–230 V
Nominal capacity:	by solution and implementation
Converter:	direct current
Protection type:	IP 20 (IP 65-66 optional)
Dimmable	yes
Controls and settings:	DALI (KNX, DMX, Casambi optional)
Photometric data:	flicker-free
Colour rendering index (CRI):	> 90
Unified glare rating (UGR):	< 19
Colour temperature:	von 2700 K bis 6500 K
RGB / RGBW:	optional
Standard:	CE



**LED technologies available**

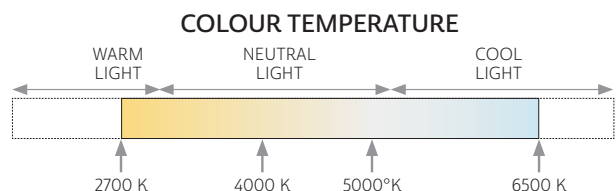
**BASIC lighting: static white**

This effective solution offers quality lighting and allows users to adjust the light intensity. However, the light temperature must be stipulated when ordering.



**CONFORT lighting: tunable white**

Thanks to the tunable white function, with Swisstop® users can switch smoothly between different tones of white light: from warm white (2700°K) to cool white (6500°K). Users can also adjust the light intensity.





### CONFORT+ lighting: human centric circadian lighting

By providing the right light (light temperature and intensity) at the right time, human centric lighting (HCL) creates an environment that replicates the changes in natural daylight, taking into account the visual, biological and emotional impact this has on people. Neutral or cool white light in the morning stimulates us, whereas a warm white light is relaxing and more suitable for the evening. HCL is not only good for our health and well-being, it also enhances performance by having a positive impact on people's natural circadian cycle (body clock).

With this automatic premium Swisstop® lighting version, end users no longer have to adjust the light settings.

Users can make manual adjustments if they wish to alter the light intensity or colour from time to time.



Changes in the sun's colour temperature and position in the sky - Lighting up your life, night and day.

*HCL stimulates and encourages the positive development of a company's most precious resource - its employees. This can be clearly seen in their performance and productivity.*

Source: At Kearney, *Quantified Benefits of Human Centric Lightning* (2015)

- + 2 HOURS** of productivity per month
- + 1 YEAR** Employee loyalty
- 1%** Absenteeism and sickness

### Installation and commissioning

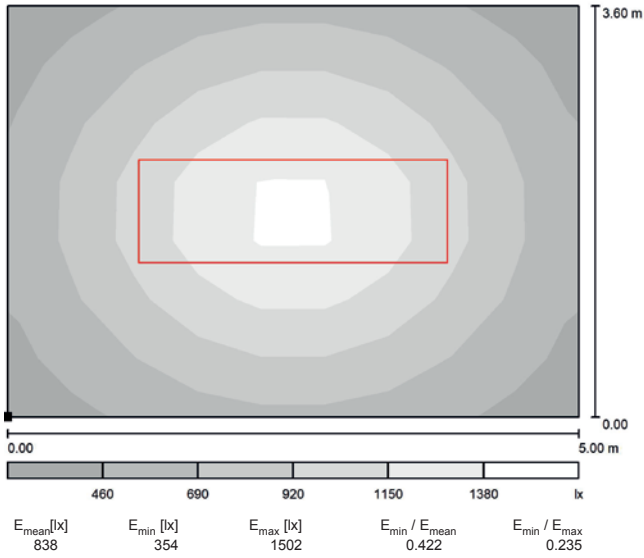
Swisstop® high quality and specialised solutions can be perfectly integrated into any project. Whether you choose **AIR**, **KIGO** or **LILO**, all of Swisstop® solutions are delivered fully equipped and wired, ready to be connected to the grid. On-site installation is also an integral part of the service provided and guaranteed by Swisstop®.

Our electric wiring is suitable for a mains supply of 200 – 230 V. Any work with a higher voltage must be carried out by a certified electrical contractor of your choice.

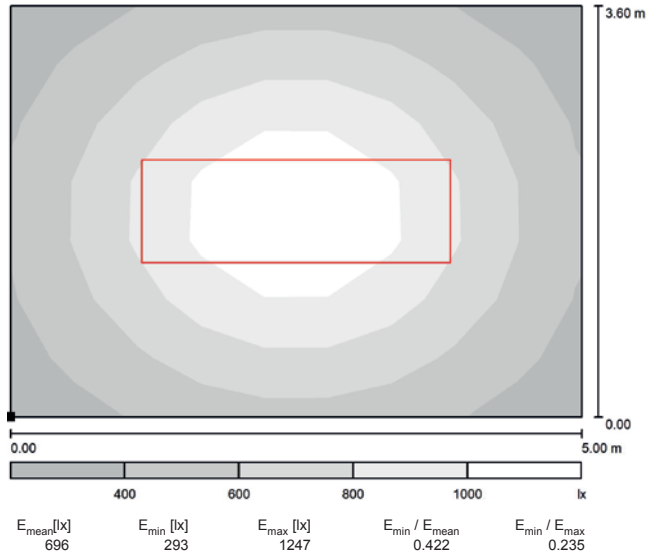


Photometric curves

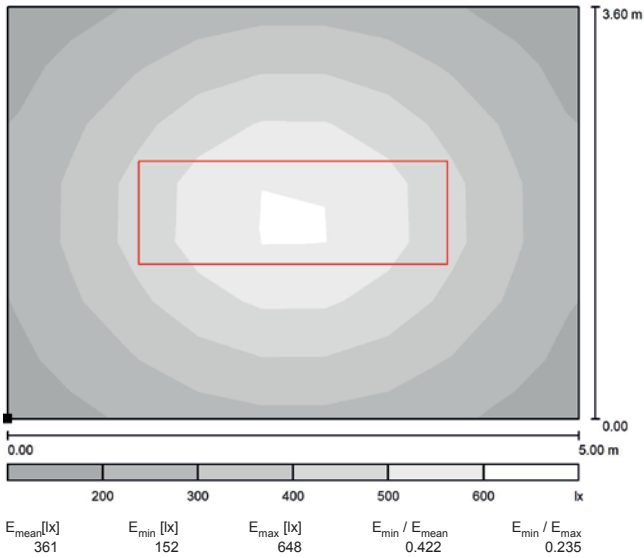
Solution: **Swisstop® LILO**  
 Finishing: copolymer + acoustics  
 Lighting: Confort+



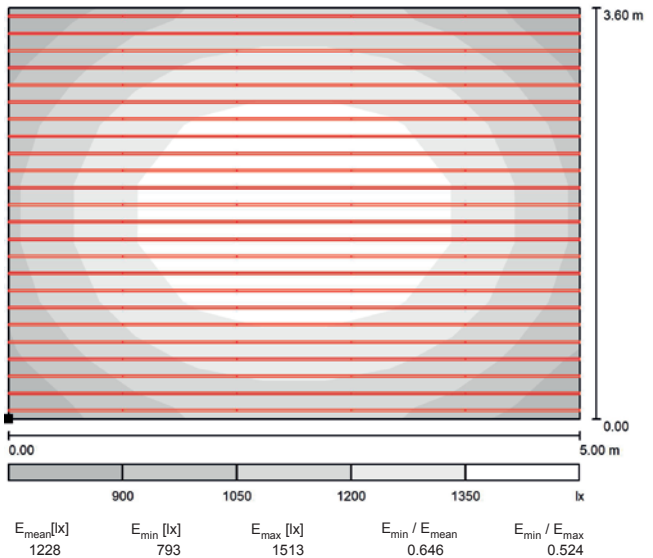
Solution: **Swisstop® LILO**  
 Finishing: textile + acoustics  
 Lighting: Confort+



Solution: **Swisstop® LILO**  
 Finishing: textile + customisation + acoustics  
 Lighting: Confort



Solution: **Swisstop® AIR / KIGO**  
 Finishing: copolymer + acoustics  
 Lighting: Basic



Detailed photometric curves are available for each of the Swisstop® solutions and for each finishing and variation. Please ask us if you have any questions.





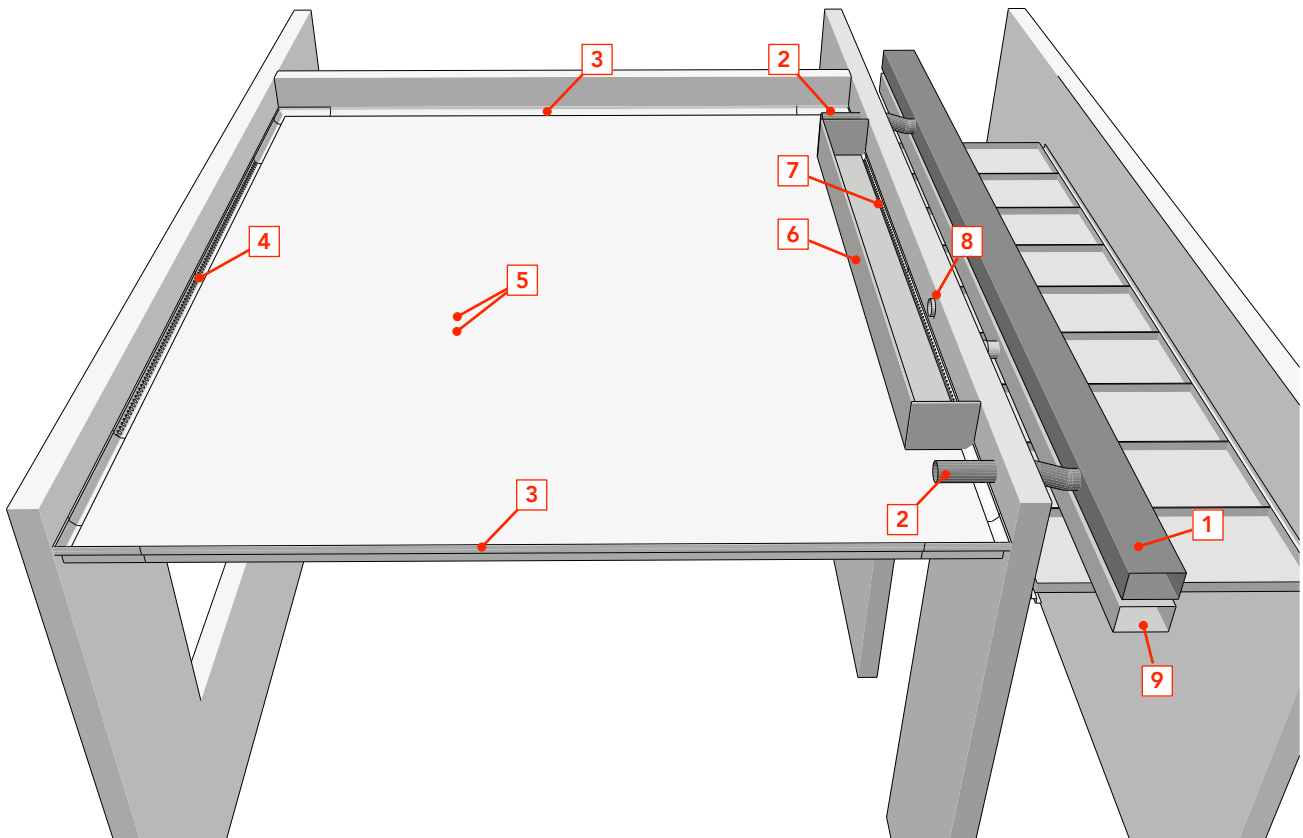


## Capacity, temperature, air flow

The required capacity for heating and cooling should be calculated by a professional, taking into account the desired room temperatures and the climatic conditions. The required heating capacity is largely dependent on the quality of the building's envelope and the surfaces that face outwards or towards non-heated areas. Conversely, the required cooling capacity is more influenced by translucent surfaces and their type of solar protection, by the heat given off by occupants, appliances and lighting. The building's thermal inertia also plays an important role.

The flow of fresh air used to renew air in the room by evacuating the same quantity of stale air, depends mainly on the number of people in the room. The average air requirement is 20 to 30 m<sup>3</sup>/h per person.

### Swisstop® AIR



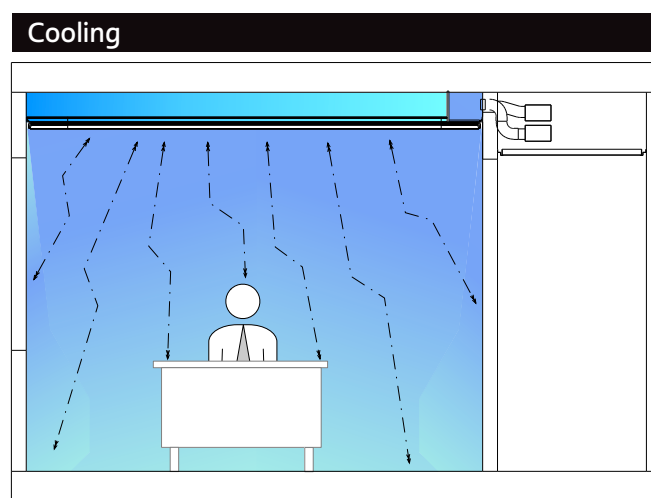
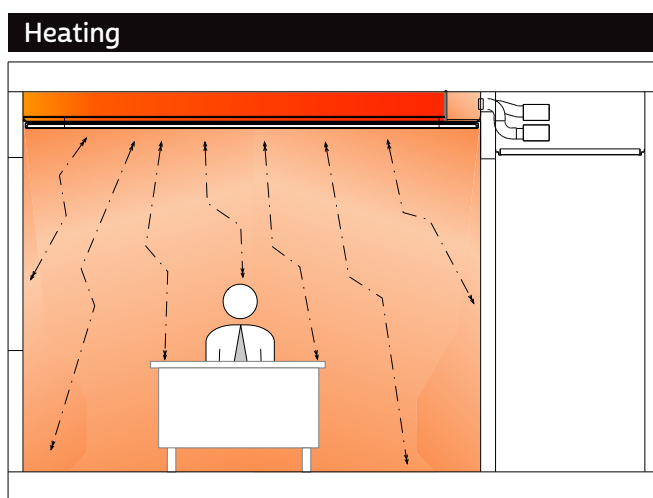
- |                                   |   |                                     |
|-----------------------------------|---|-------------------------------------|
| <b>1</b> Supply air duct          | <b>4</b> Perforated air supply profile    | <b>7</b> Perforated exhaust profile |
| <b>2</b> Air supply in the plenum | <b>5</b> Single or double stretch ceiling | <b>8</b> Return to chamber          |
| <b>3</b> Non-perforated profile   | <b>6</b> Return chamber                   | <b>9</b> Return duct                |



With Swisstop® AIR, most of the capacity is brought into the room via radiation from the stretch ceiling, which is heated or cooled by the air introduced by the ventilation system into the plenum above it. The remainder of capacity comes from air flowing into the room from the perforated profiles.

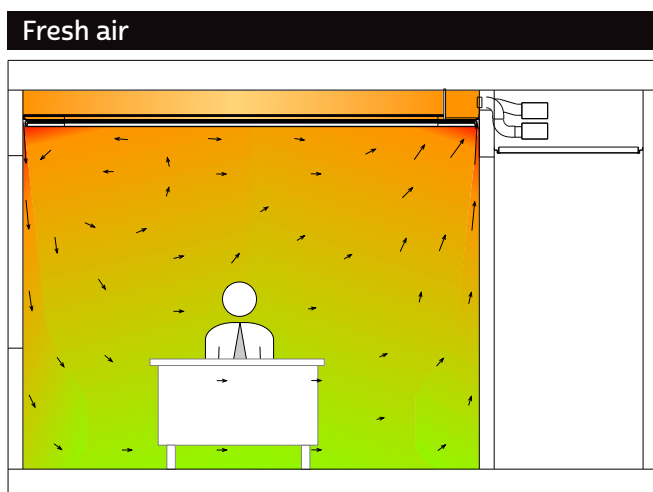
The air temperature in the plenum may be significantly different to the room temperature as radiation from the stretch ceiling reduces this difference. The temperature of the air flowing into the room will only be slightly higher than room temperature when heating and slightly cooler when cooling. This airflow is therefore imperceptible in both modes and the fresh air is mixed efficiently with the air in the room, even in heating mode.

Radiation from the stretch ceiling is distributed in all directions and heats or cools all surfaces. In this way, the temperature obtained is almost perfectly uniform, with only slight differences, providing a high level of comfort.



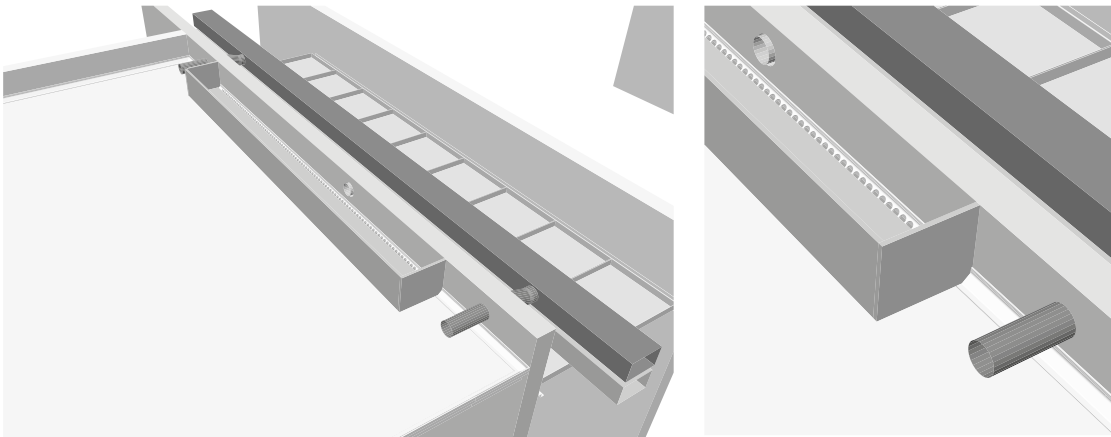
*Radiation and uniform temperatures in heating and cooling mode.*

Air is supplied through a vent in the perforated profile, which has been fixed to a wall. The air travels down the wall to the floor and mixes with the air in the room. This mixing of air and the reduced flow rate mean that no difference in temperature can be felt in the comfort zone. The air then reaches the other end of the room and is returned via the perforated profile and evacuated by the return chamber and the ventilation system.



*Air flows cross the room at a very low rate in the comfort zone.*





*Return chamber in the plenum.*

With the standard perforated profile and its 15 mm air vent, the following values are authorised:

AUTHORISED RATES	AIR SUPPLY	AIR RETURN
Minimum	1.35 m/s	0.8 m/s
Nominal	1.7 m/s	1.5 m/s
Maximum	2.5 m/s	1.8 m/s

AIRFLOW AUTHORISED	AIR SUPPLY	AIR RETURN
Minimum	73 m <sup>3</sup> /h/ml	43 m <sup>3</sup> /h/ml
Nominal	92 m <sup>3</sup> /h/ml	81 m <sup>3</sup> /h/ml
Maximum	135 m <sup>3</sup> /h/ml	97 m <sup>3</sup> /h/ml

To ensure an even flow of return air, the cross-section of the chamber, which seals off the air supply zone in the plenum, is designed so that the maximum airflow is around 1 m/s.

Special calculation tools are required for the sizing of this solution.

Compliance with the nominal values ensures an optimal distribution of air with an extremely low noise level of 25 to 30 dB (A) and pressure loss of around 10 Pa in the perforated profiles. Every precaution must be taken to ensure that the ventilation equipment and air conditioning units do not cause any sound pressure which could be heard in the room.

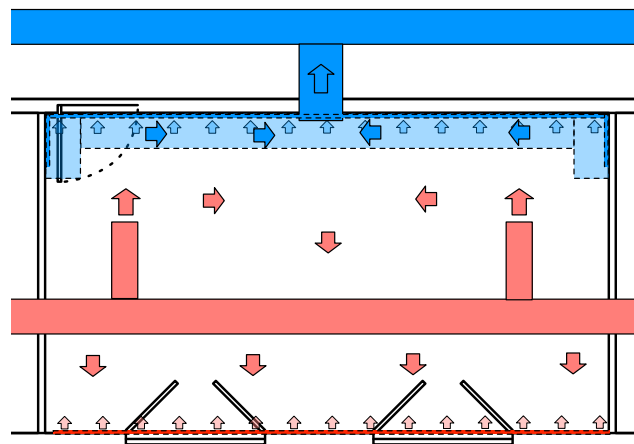


**Example**

A 4-person office measuring 8.1 m wide, 4.6 m long and 2.6 high (floor to ceiling). Surface area of 37.3 m<sup>2</sup> and volume of 97 m<sup>3</sup>.

Heating requirements are 25 W/m<sup>2</sup> for a room temperature of 21°C and cooling requirements of 40 W/m<sup>2</sup> for a room temperature of 26°C.

The ventilation system provides 30 m<sup>3</sup>/h of fresh air per person at a neutral temperature (room temperature).

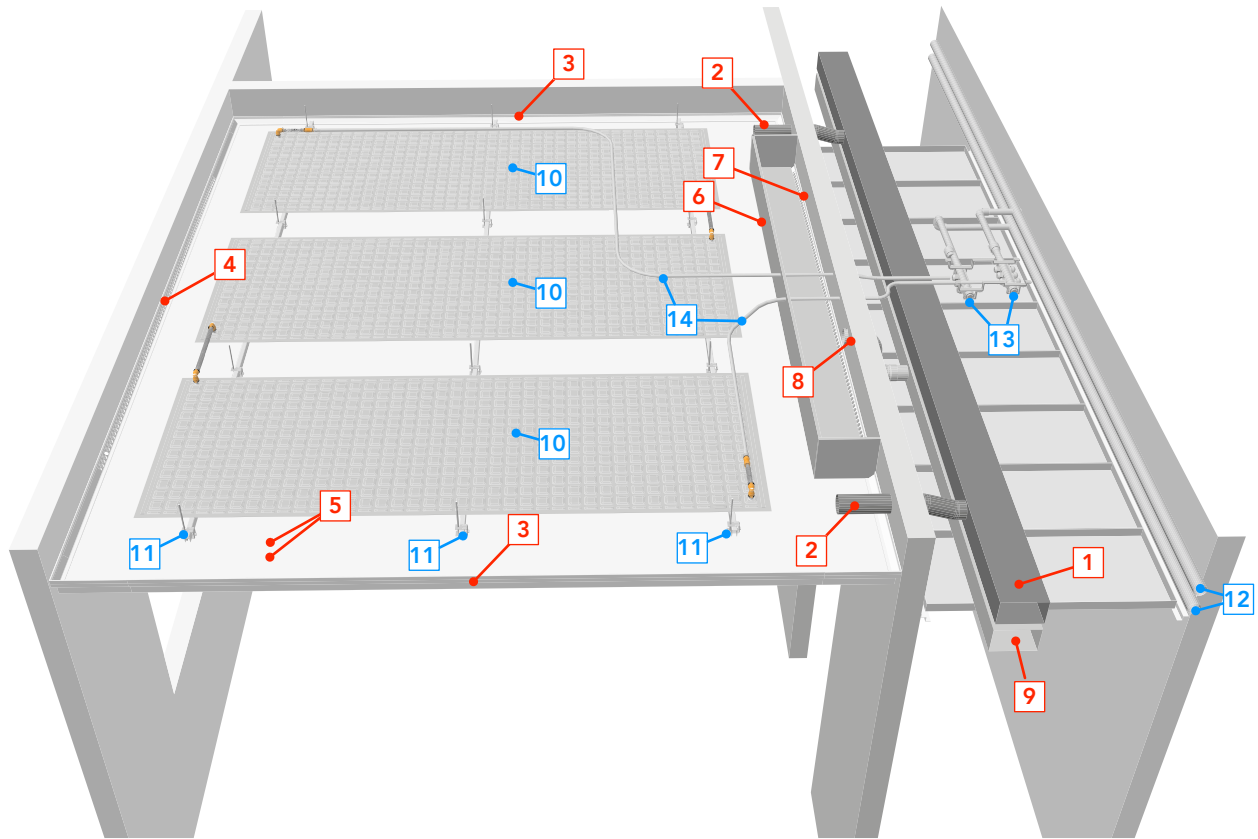


In this case, the sizing calculation is as follows:

SIZING CALCULATION		HEATING	COOLING
Specific requirement without air renewal	W/m <sup>2</sup>	25	-40
Room and return temperature	°C	21	26
Power requirement without air renewal	W	932	-1490
Volume flow air circulation	m <sup>3</sup> /h	650	650
Total airflow	m <sup>3</sup> /h	800	800
Fresh air temperature	°C	21	26
Temperature of air leaving air conditioning unit	°C	24.5	20.4
Supply air capacity	W	371	-587
Stretch ceiling capacity	W	561	-904
Delta T LOG	K	2.271	-3.616
Estimated vent temperature	°C	22.4	23.8
Calculated vent temperature	°C	22.4	23.8
Difference supply air temperature	K	1.4	-2.2
To be supplied by ventilation exchanger	W	1106	-1770
Warming of fresh air	W	175	-279
Stretch ceiling capacity	W	561	-904
Supply air capacity	W	371	-587
Total capacity in room	W	932	-1490
Percentage from stretch ceiling		60%	61%
		AIR SUPPLY	AIR RETURN
Calculated length of perforated profile	lfm	8.71	9.88
Length used	lfm	8	9.5
Actual flow rate in vent	m/s	1.9	1.6



**Swisstop® KIGO**



- |   |   |
|---|---|
| <b>1</b> Supply air duct                  | <b>9</b> Return ventilation duct                        |
| <b>2</b> Air supply in the plenum         | <b>10</b> KIGO climate panels                           |
| <b>3</b> Non-perforated profile           | <b>11</b> Optional sub-construction                     |
| <b>4</b> Perforated air supply profile    | <b>12</b> Heating and chilled water ducts in changeover |
| <b>5</b> Single or double stretch ceiling | <b>13</b> Distributor for several rooms                 |
| <b>6</b> Return chamber                   | <b>14</b> Connecting ducts                              |
| <b>7</b> Perforated return profile        |   |
| <b>8</b> Return to chamber                |   |

Although the majority of its components are the same as those of Swisstop® AIR, Swisstop® KIGO is based on a different transmission medium. The heating or cooling capacity is supplied to the plenum by the KIGO climate panels, which are filled with either warm or chilled water. The ventilation flow is limited to renewing fresh air in the room.

The KIGO radiating panels are fixed to the ceiling or placed on a sub-structure suspended from the ceiling. The panels are connected to the heating and chilled water system and radiate directly through the stretch ceiling, transmitting around 60% of their capacity. They change the air temperature in the plenum and adapt the temperature of fresh air when needed. The average temperature in the plenum lies between that of the climate panels and room temperature, allowing the rest of the stretch ceiling to balance the heat exchange. The remainder of the capacity is supplied to the room by air flowing from the vent at a temperature very close to room temperature.





The deadweight of the KIGO panels is 10 kg/m<sup>2</sup> and they can hold 2.6 l/m<sup>2</sup>.

The standard heat exchanger measuring 2.03 m<sup>2</sup> (L 2360 X H 860 mm) thus weighs 20 kg when empty and 25.2 kg when in use.

The tables below show the capacity supplied by the KIGO panels to the room through the stretch ceiling and their specific coefficients for different supply and return temperatures and a panel surface corresponding to 38% of the room. Capacity is based on the surface area of the KIGO panels.

Swisstop® KIGO							k	9.662
COOLING							n	1.020
STANDARD FRESH AIR FLOW FRESH AIR TEMPERATURE = ROOM TEMPERATURE							Activation	38%
Ta	Tiw	Tow	ΔTw	ΔTm	P	Ps	Qw	HR max
[°C]	[°C]	[°C]	[K]	[K]	[W/m <sup>2</sup> ]	[W/m <sup>2</sup> /K]	[l/h/m <sup>2</sup> ]	[%]
22	15.0	17.0	2.0	6	60	10.0	25.9	65
22	15.0	18.0	3.0	5.5	55	10.0	15.8	65
22	16.0	19.0	3.0	4.5	45	10.0	12.9	69
24	15.0	18.0	3.0	7.5	75	10.1	21.7	57
24	16.0	19.0	3.0	6.5	65	10.0	18.7	61
24	17.0	20.0	3.0	5.5	55	10.0	15.8	65
<b>26</b>	<b>16.0</b>	<b>19.0</b>	<b>3.0</b>	<b>8.5</b>	<b>86</b>	<b>10.1</b>	<b>24.6</b>	<b>54</b>
26	16.0	20.0	4.0	8	81	10.1	17.3	54
26	17.0	21.0	4.0	7	70	10.0	15.1	58

Swisstop® KIGO							k	6.334
HEATING							n	1.074
STANDARD FRESH AIR FLOW FRESH AIR TEMPERATURE = ROOM TEMPERATURE							Activation	38%
Ta	Tiw	Tow	ΔTw	ΔTm	P	Ps	Qw	
[°C]	[°C]	[°C]	[K]	[K]	[W/m <sup>2</sup> ]	[W/m <sup>2</sup> /K]	[l/h/m <sup>2</sup> ]	
19	33.0	30.0	3.0	12.5	95	27.4	65	
19	35.0	30.0	5.0	13.5	104	17.8	65	
19	40.0	35.0	5.0	18.5	145	25.0	69	
<b>20</b>	<b>33.0</b>	<b>30.0</b>	<b>3.0</b>	<b>11.5</b>	<b>87</b>	<b>25.0</b>	<b>57</b>	
20	35.0	30.0	5.0	12.5	95	16.4	61	
20	40.0	35.0	5.0	17.5	137	23.6	65	
21	33.0	30.0	3.0	10.5	79	22.7	54	
21	35.0	30.0	5.0	11.5	87	15.0	54	
21	40.0	35.0	5.0	16.5	129	22.1	58	



For other supply and return temperatures, capacity is calculated using  $P=k*(\Delta Tm)n$ .

The capacity supplied to the climate panels may vary, however, as they also influence the temperature of air in the plenum and that of the fresh air.

For other activation rates, please get in touch with your Swisstop contact. A greater or smaller number of panels will have an impact on capacity.

The table below shows the pressure loss of groups of standard KIGO heat exchangers measuring 2360 x 860 mm, connected as standard with two Ø 15 mm connectors for different specific airflows authorised. Connecting accessories such as ball valves, quick connectors and flexible ducts account for the majority of pressure losses, which are taken into account in the amounts indicated below. For smaller-sized exchangers, the values below can be applied directly.

Pressure losses from any "balancing valves" are not accounted for in the amounts below.

EXCHANGERS WITH 2 OPENINGS: TOTAL PRESSURE LOSS (+/- 5%) OF GROUP (KPA)							
Number of panels as standard (pieces)	Specific flow [l/h/m²]						
	15	25	35	45	55	65	75
2	1)	0.5	0.8	1.3	1.8	2.4	3.1
3	0.6	1.4	2.4	3.8	5.4	7.3	9.6
4	1.2	2.9	5.3	8.4	12.1	16.5	21.7
5	2.2	5.4	9.9	15.7	22.8	31.3	2)
6	3.6	8.9	16.5	26.4	2)	2)	
7	5.5	13.7	25.6	2)			
8	7.9	20.0	37.4				

1) Insufficient air flow

2) Air flow more than 500 l/h unauthorised for flexible connectors (risk of vibration and resonance)


**Swisstop® LILO**

The tables below show the capacity supplied by the LILO sails and their specific coefficients for different supply and return temperatures. Capacity is based on the gross surface area of LILO, which is 2.4 m x 0.9 m, i.e.

2.16 m<sup>2</sup> for the standard model.

In cooling mode, the maximum humidity of fresh air is also shown (HR max).

Swisstop® LILO							k	8.327
COOLING							n	1.141
AIRFLOW 100 M3/H FRESH AIR TEMPERATURE = ROOM TEMPERATURE							LIGHT	WITHOUT
Ta	Tiw	Tow	ΔTw	ΔTm	P	Ps	Qw	HR max
[°C]	[°C]	[°C]	[K]	[K]	[W/m <sup>2</sup> ]	[W/m <sup>2</sup> /K]	[l/h/m <sup>2</sup> ]	[%]
22	14.0	16.0	2.0	7	77	11.0	33.0	61
22	15.0	17.0	2.0	6	64	10.7	27.7	65
22	16.0	18.0	2.0	5	52	10.4	22.5	69
22	16.0	19.0	3.0	4.5	46	10.3	13.3	69
24	14.0	16.0	2.0	9	102	11.4	44.0	54
24	15.0	17.0	2.0	8	89	11.2	38.5	57
24	16.0	18.0	2.0	7	77	11.0	33.0	61
24	16.0	19.0	3.0	6.5	70	10.8	20.2	61
26	15.0	18.0	3.0	9.5	109	11.4	31.2	51
26	16.0	18.0	2.0	9	102	11.4	44.0	54
<b>26</b>	<b>16.0</b>	<b>19.0</b>	<b>3.0</b>	<b>8.5</b>	<b>96</b>	<b>11.3</b>	<b>27.5</b>	<b>54</b>
26	17.0	19.0	2.0	8	89	11.2	38.5	58

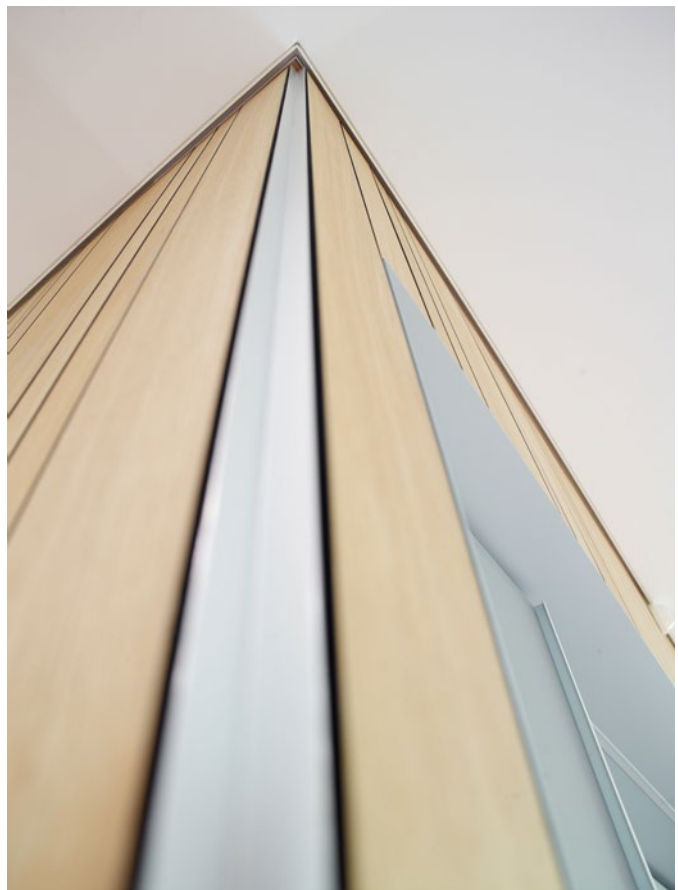
Swisstop® LILO							k	8.327
HEATING							n	1.141
STANDARD FRESH AIR FLOW FRESH AIR TEMPERATURE = ROOM TEMPERATURE							LIGHT	WITHOUT
Ta	Tiw	Tow	ΔTw	ΔTm	P	Ps	Qw	
[°C]	[°C]	[°C]	[K]	[K]	[W/m <sup>2</sup> ]	[W/m <sup>2</sup> /K]	[l/h/m <sup>2</sup> ]	
19	31.0	28.0	3.0	10.5	96	9.1	27.6	
19	33.0	30.0	3.0	12.5	117	9.4	33.7	
19	35.0	32.0	3.0	14.5	139	9.6	39.9	
20	32.0	30.0	2.0	11	101	9.2	43.6	
20	33.0	30.0	3.0	11.5	107	9.3	30.6	
20	35.0	32.0	3.0	13.5	128	9.5	36.8	
21	32.0	30.0	2.0	10	91	9.1	39.1	
<b>21</b>	<b>33.0</b>	<b>30.0</b>	<b>3.0</b>	<b>10.5</b>	<b>96</b>	<b>9.1</b>	<b>27.6</b>	
21	35.0	32.0	3.0	12.5	117	9.4	33.7	





The pressure losses of the sails are indicated in the table below. For optimal capacity, there must be a turbulent flow in the copper activation tube. If the flow is too weak, it is shown as "Re < 2000". If the flow is too strong and exceeds 0.6 m/s, it can become audible.

PRESSURE LOSS KPA						
LILO dimensions LILO 2400x900		Activation 2x380mm L=2000mm			Activation Ø 12 mm	
Number of sails in series	Specific flow [l/h/m²]					
	20	25	30	35	40	45
1	Re < 2000	Re < 2000	1.46	1.92	2.44	3.01
2	5.02	7.51	10.42	13.76	17.51	21.66
3	15.1	22.6	31.4	v > 0.6 m/s	v > 0.6 m/s	v > 0.6 m/s
4	33.2	v > 0.6 m/s	v > 0.6 m/s			
5	v > 0.6 m/s					





## Scope of services and interfaces



### Services provided

Careful planning of the project will ensure a successful installation with optimal results. Swisstop® provides the following services:

#### Swisstop® AIR

- We will undertake a feasibility study to examine the project's technical specifications based on the heating and cooling capacity as well as fresh airflow. These capacity details and calculations provided by your HVAC engineer guarantee that all technical, energy and comfort aspects are taken into account during the installation.
- We will produce principle sketches of the installation and execution for your approval.
- We will liaise with your HVAC engineer to establish the location of air supply and return and how the connection to the building's ventilation system will be effected. Your HVAC company is responsible for the entire ventilation system of your building.
- We will install the aluminium peripheral profiles based on the preliminary study to determine the position of perforated and non-perforated profiles.
- We will supply and install the 100% airtight air return chambers connected to the peripheral profiles designed to evacuate stale air. The chambers are designed and manufactured to the airflows, preventing noise generation due to the supply of air.
- We will install various recesses for components in the ceiling, including spotlights, pendant lighting, motion detectors, smoke detectors, hatches, etc.
- We will install the stretch ceiling(s) with copolymer or textile finishing.
- With regard to the final approval of works under Art. 57, ff, SIA 118, we will carry out functional tests with an infrared camera and provide an installation and commissioning report.



### Swisstop® KIGO

- We will undertake a feasibility study to examine the project's technical specifications including heating and cooling capacity as well as fresh airflow. These capacity details and calculations provided by your HVAC engineer guarantee that all technical, energy and comfort aspects are taken into account during the installation.
- We will produce principle sketches of the installation and execution for your approval.
- We will liaise with your HVAC engineer's office to establish the location of the KIGO panels and how they will be connected to the shut-off valves by group.
- We will install the KIGO panels, the flexible connectors between the panels and supply the shut-off valves to the HVAC company responsible for connecting the groups to the flow control valves.
- We will install the aluminium peripheral profiles based on the preliminary study to determine the position of perforated and non-perforated profiles.
- We will supply and install the 100% airtight air return chambers connected to the peripheral profiles designed to evacuate stale air. The chambers are tailor-made and adapted to the airflows, preventing noise generation due to the supply of air.
- We will install various recesses for the components in the ceiling, including spotlights, pendant lighting, motion detectors, smoke detectors, hatches, etc.
- We will assist the HVAC company to fill and drain the KIGO panels. Your HVAC company is responsible for the entire hydraulic system of your building.
- We will install the stretch ceiling(s) with copolymer or textile finishing.
- With regard to the final approval of works under Art. 57, ff, SIA 118, we will carry out functional tests with an infra-red camera and provide an installation and commissioning report.

### Swisstop® LILO

- We will undertake a feasibility study to examine the project's required technical specifications including heating and cooling capacity and optionally the ventilation airflow. These capacity details and calculations provided by your HVAC engineer guarantee that all technical, energy and comfort aspects are taken into account during the installation.
- We will produce principle sketches of the installation and execution for your approval.
- We will liaise with your HVAC engineer's office to establish the location of the KIGO panels and how they will be connected to the shut-off valves and optionally to the ventilation ducts.
- We will install the LILO modules and optionally the ventilation chambers, internal pipes and supply flexible ducts and shut-off valves to the HVAC company which is entrusted with connecting LILO and the flow control valves as well as optionally the ventilation ducts.
- We will assist the HVAC company to fill and drain the LILO modules. Your HVAC company is responsible for the entire hydraulic system of your building.
- We will install the stretch ceiling(s) with copolymer or textile finishing.
- With regard to the final approval of works under Art. 57, ff, SIA 118, we will carry out functional tests with an infra-red camera and provide an installation and commissioning report.





## Lighting

- We will undertake a feasibility study to examine the project's technical specifications based on the desired lighting, requirements and usage. These details and calculations provided by your electrician or lighting technician guarantee that all technical, energy and comfort aspects are taken into account during the installation.
- We will liaise with your electrical company to establish the location of the connection to the 230 V mains and to plan for the various recesses including spotlights, pendant lighting, motion detectors, smoke detectors, hatches, etc. The entire electrical system remains the responsibility of your electrician.
- We will supply the light source and the electronics for it to work flawlessly (up to 230 V), and all accessories.
- We will install and connect (up to 230 V) the chosen lighting solution.
- With regard to the final approval of works under Art. 57, ff, SIA 118, we will carry out functional tests, inspect lighting values and provide an installation and commissioning report.

### Optional services

- We can conduct a preliminary DIALux lighting study, enabling the lighting system to be planned, calculated and visualised by means of graphics.



*Swisstop® can incorporate all the accessories necessary for the flawless operation of its lighting solutions, both main and decorative lighting, except for all works and/or services on the 230 V mains. Such work must be carried out by an authorised electrician, under your management.*



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