



Over 30 years' experience  
in manufacturing textile ducting

# Textile ducts and air diffusers



Air-conditioning  
Cooling  
Transporting treated air  
Refrigeration  
Ventilation  
Space heating

**Aéro Textile Concept, technology one step ahead**  
Design - Manufacture - Maintenance

> Technical data

# Key stages for designing an aeraulics network

## Clients' data:

### Types of applications

- ▶ Food industry
- ▶ Industry
- ▶ Logistics
- ▶ Public buildings
- ▶ Laboratories / Clean rooms
- ▶ Special events & Tertiary activities

### Thermal treatments

- ▶ Chilling
- ▶ Ventilation / Air renewal
- ▶ Heating
- ▶ Cooling
- ▶ Reversible air conditioning

### Types of devices

- ▶ Unit heaters
- ▶ Evaporators/ Air coolers
- ▶ Air conditioning cabinets
- ▶ Conditioners
- ▶ Roof Top
- ▶ Heat pumps
- ▶ Air Handling Units
- ▶ Ducting

## ATC Services & solutions

### Entry data

- ▶ Flow
- ▶ Pressure
- ▶ Temperature gap between atmosphere and blown air
- ▶ Premises layout (dimensions, range, footprint...)

### Determination of network's characteristics

- ▶ Ducts' geometry. (circular, semi-circular, elliptical)
- ▶ Types of suspension
- ▶ Types of material / AIRNÉO commercial nomenclature / Types of fabric.
- ▶ Types of diffusion (Radiant, Impulsion, Energy, Hermetic)
- ▶ Number of diffusers

### Calculation of aeraulics network by ATC

- ▶ Advisory and studies service (choice of diffusion, digital simulation)
- ▶ Calculation of charge losses
- ▶ Calculation of thermal losses
- ▶ Evaluation of induction type
- ▶ Optimisation of purchase and operating costs
- ▶ Estimation of acoustic level

### AIRNÉO Products Range

### Maintenance & Service

- ▶ Cleaning
- ▶ Technical control
- ▶ Repairs



#### AÉRO TEXTILE CONCEPT

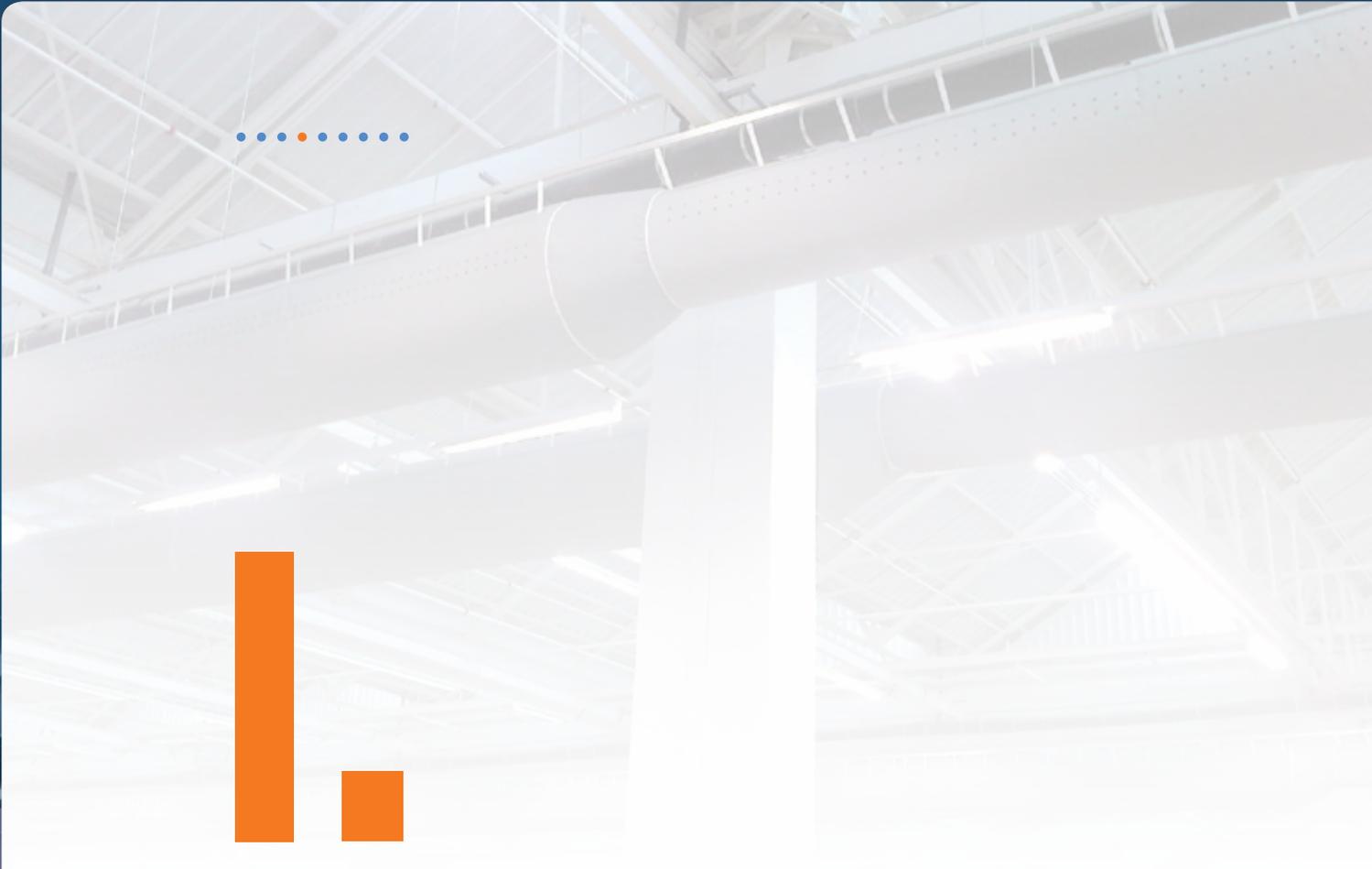
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# Index

<b>I. Technical data</b>	
1.1 TYPES OF APPLICATIONS	I.3
1.2 DIMENSIONS OF PREMISES	I.5
1.3 DETERMINATION OF FLOW	I.6
1.4 TEMPERATURE OF BLOWN AIR	I.7
<b>II. Determination of network's characteristics</b>	
2.1 TYPES OF AIR DIFFUSION	II.2
2.1.1 RADIANT	II.2
2.1.2 IMPULSION	II.3
2.1.3 ENERGY	II.5
2.1.4 HERMETIC	II.7
2.1.5 Choice of diffusion type	II.8
2.2 NETWORKS' GEOMETRY	II.9
2.2.1 Circular ducts	II.9
2.2.2 Semi-circular ducts	II.9
2.2.3 Quarter-circular ducts	II.9
2.2.4 Quarter ellipse	II.9
2.2.5 Bow string or 1/2 ellipse	II.9
2.3 SUPPORTS AND ASSEMBLY PRINCIPLES	II.10
2.3.1 Types of suspension	II.10
2.3.2 Assembly accessories	II.11
2.3.3 Technical file for different types of suspension	II.12
2.3.4 Assembly instructions	II.19
2.3.5 Time for assembly	II.22
2.3.6 Usual cautions	II.23
2.3.7 Commissioning	II.23
2.3.8 First month in service	II.23
<b>III. Calculation of aeraulics network by ATC</b>	
3.1 DIMENSIONS OF NETWORK	III.2
3.1.1 Diameter, dynamic pressure and frontal speed	III.2
3.1.2 Losses of charge	III.4
3.1.3 Speed Limitations	III.5
3.2 ACOUSTICS	III.6
3.3 DIGITAL SIMULATION	III.8
<b>IV. AIRNÉO Products Range</b>	
4.1 AIRNÉO REFERENCE LT	IV.2
4.2 AIRNÉO REFERENCE CLEAN ROOM	IV.3
4.3 AIRNÉO REFERENCE CS	IV.4
4.4 AIRNÉO REFERENCE ANTISTATIC	IV.5
4.5 AIRNÉO REFERENCE ANTIBACTERIAL	IV.6
4.6 AIRNÉO GOLD	IV.7
4.7 AIRNÉO FIRST	IV.8
4.8 AIRNÉO CLASSIC	IV.9
4.9 AIRNÉO LUMEN	IV.10
4.10 AIRNÉO ISOTEX	IV.11
4.11 AIRNÉO WALL	IV.13
4.12 AIRNÉO WARM UP	IV.15
4.13 AIRNÉO CURVE	IV.16
<b>V. Maintenance service</b>	
5.1 SERVICE PACKS	V.2
5.1.1 PACK PREMIUM	V.2
5.1.2 PACK EVOLUTION	V.3
5.1.3 PACK TEMPO	V.3
5.1.4 Bacteriological analysis	V.3
5.2 MAINTENANCE & CLEANING INSTRUCTIONS	V.5
5.2.1 Cleaning symbols	V.6
5.2.2 Instructions for maintenance of textile ducts AIRNÉO Reference LT	V.7
5.2.3 Instructions for maintenance of textile ducts AIRNÉO Classic	V.9
5.2.4 Instructions for maintenance of textile ducts AIRNÉO Gold	V.11
5.3 SERVICE PRICE REQUEST: AIRNÉO PLUS	V.12
<b>VI. Studies and quotations</b>	
6.1 PRICE REQUEST	VI.3
6.2 ISO SKETCH	VI.4
<b>VII. Lexicon</b>	VII.1





# Technical data



ATC guide you in the choice and design of your aeraulics networks. The design of an aeraulics network requires taking into account parameters which are independent from one another:

- Type of application / Objective of the air treatment
- Dimensions of the premises
- Position of the ducts in relation to people, machines
- Involved air
- Available static pressure
- Temperatures during the process (blown air, atmosphere)

Buildings' aesthetic needs, as well as physical and chemical constraints in the environment play a major part in the choice of materials:

- Diffusers' shapes and colours
- Chemical constraints
- Mechanical constraints
- Architectural constraints

The complexity in calculating air systems is therefore variable from one case to the next. In order to meet your expectations within the shortest deadlines, ATC have designed an information file outlining all of the data necessary to determine a network (available at the end of this folder).



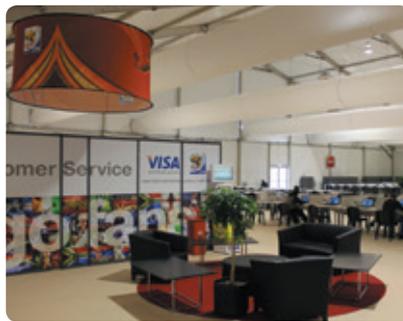
## 1.1 TYPES OF APPLICATIONS

Before the study of the different techniques and calculations relating to air treatment, it is important to establish the field of activity, as the needs can vary significantly from one application to the next:

### → Events organising / Tertiary activities

ATC offer products meeting perfectly the demands and constraints of premises in the services and event organising sectors

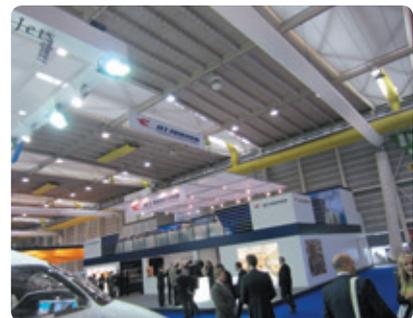
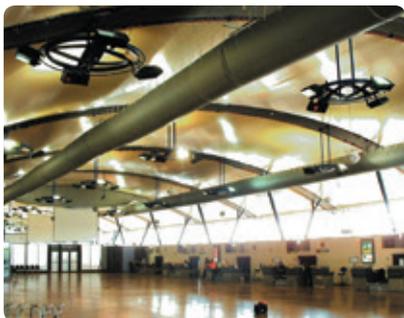
- Specificities / Constraints: comfort in reception area, importance of aesthetic aspect, fast and easy implementation, modularity ...
- Types of devices:
  - Services sector: AHU (Air Handling Unit), ducting, air coolers ...
  - Event organising: AHU, Roof Top, ducting...
- Thermal treatments: cooling, heating, reversible air conditioning ...



### → Public buildings

ATC offer products meeting perfectly the demands and constraints of public buildings (exhibition halls, cinemas, concert halls, large retail areas ...).

- Specificities / Constraints: standards (fire regulations), presence of an audience (comfort), induction type of diffusion, good consistency of temperature over large flows, fast and easy implementation, etc.
- Type of device: Roof top (air treatment unit on roof), AHU, ducting, etc.
- Thermal treatment: reversible air conditioning, heating, chilling, etc.



## → Food Industry

ATC offer products meeting perfectly the demands and constraints of the food industry:

- Specificities / Constraints: constraints of cleanability (hygiene, machine-washable fabrics ...), fast and easy assembly and dismantling (lightness of fabrics), etc.
- Types of devices: AHU, conditioners, evaporators, air coolers, etc.
- Thermal treatments: air conditioning process, chilling, optimisation of staff comfort, ventilation, air renewal / fresh air inlet, heating, etc.



## → Laboratories/ Clean rooms

ATC offer products meeting perfectly the demands and constraints of premises such as laboratories or with constraints linked to hygiene or dust control:

Specificities / Constraints: diffusion at very low speed, low release of particles, absolute hygiene, compensation of air linked to release of pollutants, air renewal, constant and stable temperature, staff comfort

- Type of device: AHU
- Thermal treatments: cooling, heating, reversible air conditioning, etc



## → Industry / Logistics

ATC offer products meeting perfectly the demands and constraints of industrial or logistics premises:

- Specificities / Constraints: staff comfort, preservation of industrial process, getting building to the right temperature quickly, zoning...
- Types of devices: AHU, conditioners, evaporators, air coolers...
- Thermal treatment: air conditioning, heating, chilling, etc.



## 1.2 DIMENSIONS OF PREMISES

In order to ensure a perfectly uniform air distribution, it is indispensable to be fully aware of the premises' dimensions and constraints:

- Volume or area to be treated
- Length of diffusion
- Height of diffuser position in relation to ground
- Range needed to treat the area
- Position of main obstacles to diffusion (machines, gantries, beams, separation screens).

From these data, the necessary flow of air to treat the premises has to be determined in the first place.

## 1.3 DETERMINING THE FLOW

Determining the necessary flow of air to treat the premises can be done through at least three different methods:

### → Through mixing rate:

In installations of simple ventilation, determining the flow can be done through choosing the mixing rate.

Mixing rate is given by the following equation:

Type of premises	Mixing rate
Amphitheatre	8 to 10 vol./h
Workshop	3 to 6 vol./h
Paint cabin	20 to 50 vol./h
Laboratory	8 to 30 vol./h
Swimming-pool	3 to 4 vol./h
Restaurant	5 to 10 vol./h

$$\Gamma_b = \frac{Q}{V}$$

with

Q : air flow [m<sup>3</sup>/h]

V : Volume of the premises [m<sup>3</sup>]

$\Gamma_b$  : Mixing rate

Table 1 : mixing rate for different applications

### → Through fresh air renewal rate:

Renewing the air within premises is necessary for their occupiers' hygiene and health. Regulatory flows are set through legislation according to the premises' nature, the number of people present on the premises and their activity:

Designation of premises	Minimum of fresh air per person (m <sup>3</sup> /h)
Offices, premises without physical work	25
Restaurant premises, retail premises, meeting premises	30
Workshops and premises with light physical work	45
Other workshop and premises	60

Table 2 : Minimum input flow of fresh air per person (Work legislation, Article R4222-6)

### → Though air cooling (or heating) power implemented:

Knowing the sensible cooling capacity and the temperature difference ( $\Delta T$ ) between atmosphere and blown air, the flow is determined through the following ratio:

$$Q = \frac{P_f}{c \cdot \rho \cdot \Delta T}$$

With:

- $c$  : Air thermal capacity [J/kg.K]
- $\rho$  : Air density [kg/m<sup>3</sup>]
- $\Delta T$  : Delta Temperature [K]
- $P_f$  : Sensible cooling capacity [W]

## 1.4 TEMPERATURE DIFFERENCE

Knowing the temperature difference ( $\Delta T$ ) between atmosphere and blown air is crucial in determining the type of diffusion:

- Chilling
- Cooling
- Ventilation, air renewal, fresh air input
- Reversible air conditioning
- Heating

The aim of diffusion is to combat or amplify natural convection phenomena:

- Within the framework of cooling, the textile diffuser allows to amplify convection phenomena, whilst accurately directing the air flow.
- Within the framework of heating, the textile diffuser must combat natural convection in order to avoid stratification.



# Determining the network's characteristics



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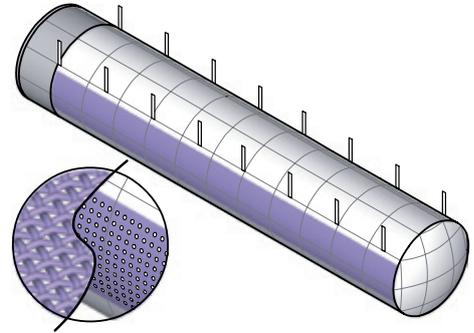
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## 2.1 TYPES OF AIR DIFFUSION

### 2.1.1 RADIANT

#### → Principle

In the case of textile diffusers AIRNÉO of RADIANT type, air discharge is exclusively through porous material strips in judicious places and dimensions in order to create the desired charge loss and let through the desired air flow. This diffusion brings about optimum user comfort, almost immediately next to the duct, thanks to low discharge speeds around 0.2 to 1 m/s. Thus, the movements in the mass of discharged air are mainly due to differences in temperature between the various masses of air concerned.



#### → Conditions and limitation of use (characteristics)

Use in refrigeration, (Diagram 1), implies perfect knowledge of air blown into the premises. In effect, a too great temperature gap ( $\Delta T$ ) implies:

- a weak diffusion range
- a concentration of cold air under the diffuser, thus creating a phenomenon known as « cold shower »
- an increase in the speed of the air jet as it comes down: cold air comes down all the faster if its temperature is slow in relation to the ambient temperature
- a condition of discomfort in the occupied area
- the use of a greater number of textile diffusers in order to spread the treated air correctly
- an increase in the installation's cost

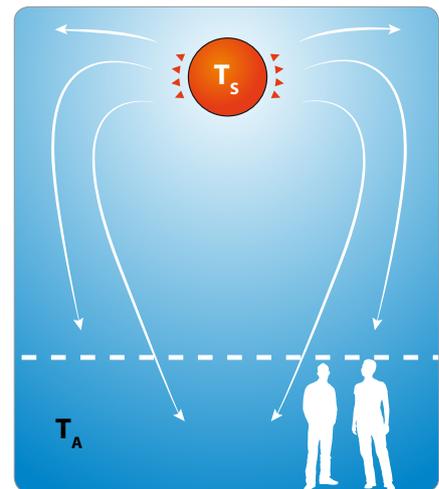


Figure 1 : diffusion de type RADIANT

It is advised not to use this for heating, unless the height of the ceiling is very low, combined with a recirculation below or if the diffusers are implanted in a low position and provided the  $\Delta T$  is low. If the temperature differential is too high:

- hot air is difficult to direct towards the bottom, the diffusion energy being too low to overcome its inertia.
- the air comes back up quickly towards the top of the premises, thus creating a temperature stratification.
- heating of the occupied area is then more difficult to carry out. In reality, the  $\Delta T$  used is between 1 and 5°C.

→ Advantages

■ Better air quality

Thanks to the porous character of the textiles used, the diffusion ducts of RADIANT type, besides their diffusion function, give a particularly interesting terminal filtration.

This guarantees an effective protection for products and staff, when textile diffusers are used in environments sensitive to hygiene such as the food and pharmaceuticals industries. The use of textile diffusers of RADIANT type requires nevertheless an effective filtration upstream (filters G4, F7 ...), which allows:

- to avoid clogging too quickly and therefore having to clean too often
- to limit the growth and proliferation of micro-organisms
- to maintain the original operation point (ratio flow /pressure) which guarantees the aeraulics result

■ Better working conditions

When premises have low ceilings (from 2 to 4 m approx.), the duct allows to avoid any sensations of draughts brought about by the blowing system (low residual speed).

■ Better process conditions

Ideal when products require a perfectly homogeneous atmosphere and low residual speeds. For instance, in rooms with need for dust control, metrological rooms, laboratories ...

■ Better hygiene

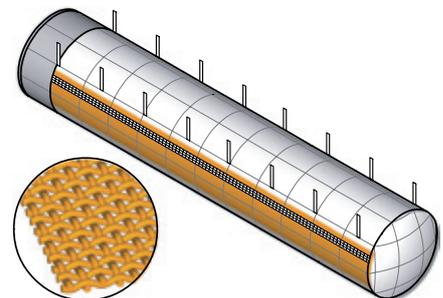
The AIRNÉO duct of RADIANT type is entirely washable (machine wash), ensuring perfect hygiene.

2.1.2 IMPULSION

→ Principle

Air treatment for premises of average height (3 to 6 m) requires air diffusion with strong displacement energy (low induction). To that effect, ATC designed textile diffusers of IMPULSION type, which:

- allow use of greater temperature gradients between ambient air and blown air ( $\Delta T$ ) than ducts of RADIANT type
- allow to emit primary blown air with a higher displacement energy and a more important induction rate.



→ **Characteristics**

IMPULSION type diffusers are mainly characterised by:

- average range (3 to 8 m)
- relatively low ventilation power
- straight air vein in isothermal and curved line in anisothermal (Diagram 2), with less sensitive incidence of temperature compared to a RADIANT type diffusion
- if the air jet is directed in parallel to a smooth ceiling, a « Coanda Effect » (Diagram 3) is obtained, thus lengthening the throw by a factor of  $\sqrt{2}$ .

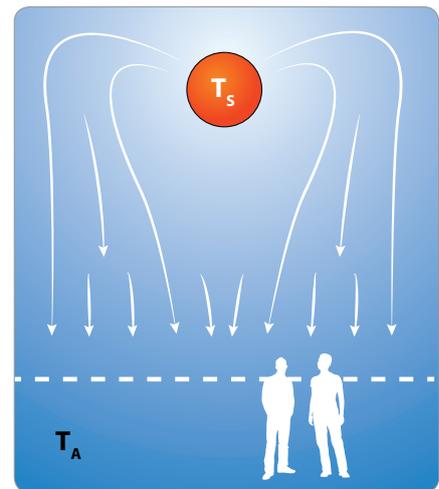


Diagram 2 : IMPULSION type diffusion

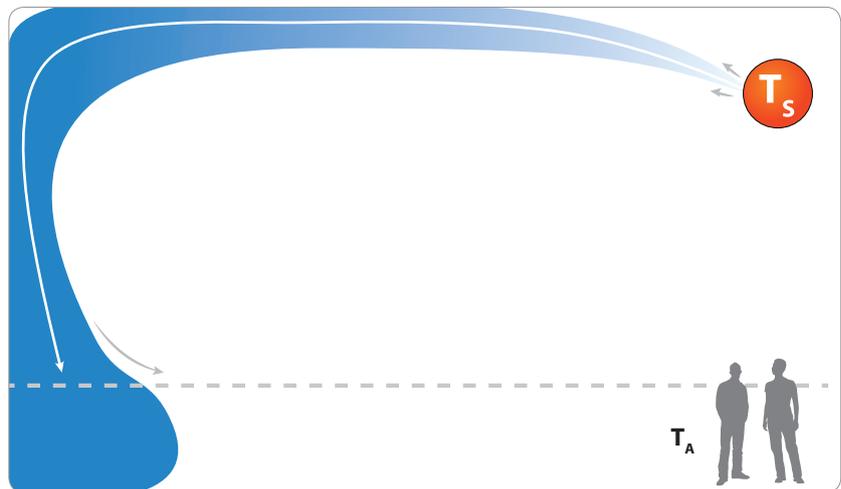


Diagram 3 : Coanda effect

→ **Advantages**

■ **Operation in reversible air conditioning**

When using mixed systems (heating /cooling) known as « reversible », IMPULSION type diffusers are appropriate. In order to control and optimise diffusion, it is essential to know the admissible  $\Delta T$  and residual air speeds in the occupied area.

■ **Better hygiene**

The AIRNÉO duct of IMPULSION type is entirely washable (machine wash), ensuring perfect hygiene.

### 2.1.3 ENERGY

#### → Principle

Air treatment for premises with a height of up to 20m poses the problem of temperature homogeneity and of residual air speed in the occupied area.

Air diffusion through traditional diffusion methods brings about:

- temperature gaps in the volume (strong stratification)
- high residual speeds in the occupied area

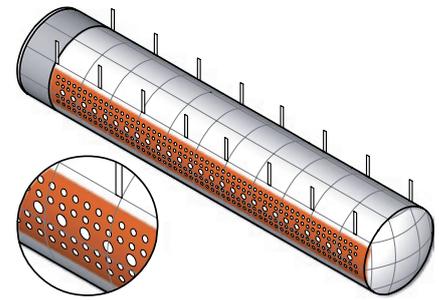
ATC have perfected textile diffusers of ENERGY type allowing to distribute and diffuse large quantities of treated air for these large volume premises.

This diffusion is based on the jets in free fields theory associated to induction phenomena.

It guarantees:

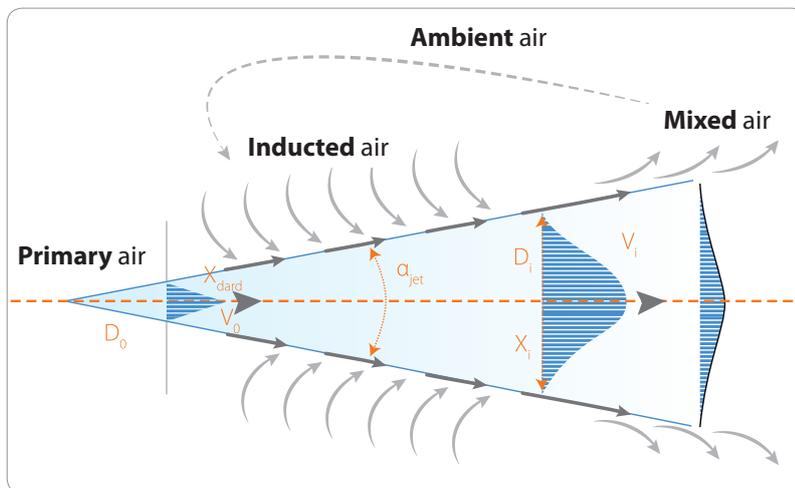
- homogeneous temperature at any point in the premises
- air speeds in the occupied area conforming to comfort requirements for the staff working there

The air is released through orifices distributed on the duct's surface in the areas where air distribution is needed.



#### → Characteristics

Air released at high speed through the orifice creates a considerable depression around the latter, dragging a large quantity of ambient air. This mass of mixed air finds itself at a temperature very close to isothermal (Diagram 4).



with

$V_0$  = discharge velocity of the jet (at the orifice) [m/s]

$V_i$  = speed at a point  $i$  on the axis of the jet [m/s]

$\alpha_{jet}$  = jet angle

$D_0$  = hole diameter (or slot width) [m]

$D_i$  = diameter of jet [m]

$X_{dard}$  = length of peak (maximum constant speed)

$x_i$  = abscissa of a point  $i$  on the axis of the jet [m].

Diagram 4: speeds profile outside jet axis with illustration of the phenomenon

Induction is a phenomenon which allows, through blowing a reduced air flow, to create a movement in a much greater flow of ambient air; induction is quantified by the rate of induction eg.  $T_i$

$$T_i = \frac{\text{Flow of primary air}}{\text{Flow of mixed air}}$$

For a given diameter, the rate of induction has a linear increase in relation to the distance to the duct.  
According to the release speed (from 8 to 25 m/s), the distribution, number and diameter of orifices, we obtain:

- either an average induction and a very large throw
- or a strong induction with a very large mass of air set in motion and a weaker throw

Several diffusion models are available, allowing to guarantee an optimum aeraulics result in terms of induction.

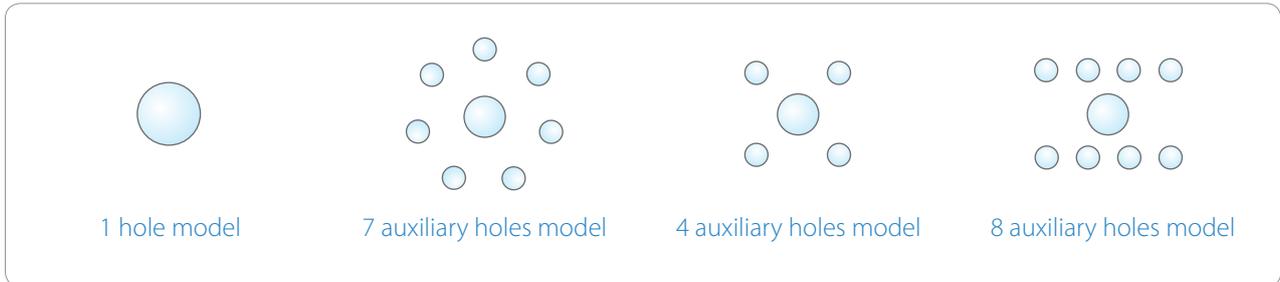


Diagram 5: Examples of diffusion models

According to the section, the perforations model is refined into a number of holes and reproduced regularly along the duct. The jets generated by the auxiliary holes engender a strong induction and allow to improve it by up to 15 %. Within a few centimeters of the duct, the auxiliary jets fuse with the central air jet and improve the throw of air further.

→ **Advantages**

■ **More savings**

The use of a greater  $\Delta T$  when blowing allows to reduce the installation's total flow as well as the diffusers' diameter. This allows a significant reduction in investment for the premises' air treatment.

■ **Optimised investment costs**

Using a high induction associated to high throws, allows to limit the number of diffusion antennas.

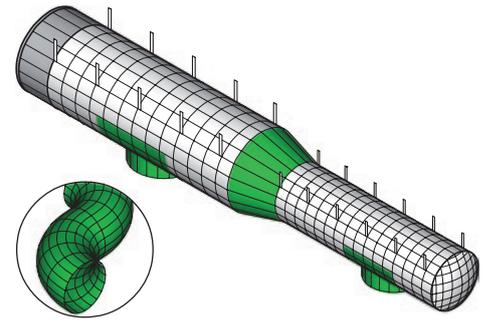
■ **Control of maintenance costs**

The AIRNÉO duct of ENERGY type allows to reduce maintenance costs. Clogging is practically zero and the number of cleaning stops for the system is therefore limited to the level of hygiene required by the user

### 2.1.4 HERMETIC

#### → Principle

The use of non-diffusing textile ducts or insulated ducts allows to carry the air from one point to another. This solution can satisfactorily replace traditional distribution networks made of galvanised steel. The use of this type of textile duct is exclusively reserved to blowing ducts with a positive pressure.



#### → Characteristics

##### ■ Design

All of AIRNÉO non-diffusing networks are made from a wide range of technical materials adapted to specific conditions of use.

Assembling these materials is designed and carried out in such a way as to ensure optimum sealing of the ducts. Connexion between different sections and elements is ensured by slide fasteners.

##### ■ Assembly

Simplicity of implementation as well as minimal support allow to solve problems often encountered with traditional networks:

- Considerable loads on the structure of existing buildings
- Long installation times
- Support structure with poor or no aesthetics
- Means of handling and / or lifting relatively important (crane, forklift...)

#### → Advantages

##### ■ Simplified assembly

These ducts' assembly systems allow to install a distribution network much faster than the traditional galvanised steel duct.

##### ■ Quieter installation

Thanks to their design, AIRNÉO textile networks reduce transmission of sound vibrations produced by ventilation units.

##### ■ Faultless hygiene

All components of our textile networks can be cleaned.

### 2.1.5 Choice of diffusion type

The choice of diffusion is determined according to several combined or isolated characteristics.

	RADIANT	IMPULSION	ENERGY
<b>Physical or geometric characteristics</b>			
Sound level	low	low	low
Possible $\Delta T$	low	medium	medium to high
Height of premises	< 4 m	< 8 m	up to 30 m
Throw	up to 4 m very low	Up to 8 m limited	Up to 30 m High
Need for insulation	no	no	no
<b>Aeraulics characteristics</b>			
Condensation	limited	limited	limited
Reversible system	ill adapted	adapted	perfectly adapted
Ventilation de confort	adapted	adapted	adapted

Textile ducts offer many advantages in relation to rigid ducts:

- Limited investment and reduced transport costs
- Low weight in suspension, limited number of intermediary supports
- Simple implementation and installation, limited installation time
- Easy to clean, better hygiene
- Wide choice of colours, screen printing

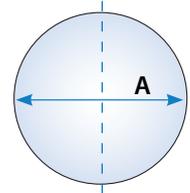
## 2.2 NETWORKS' GEOMETRY

Whatever the diffusion type may be, ATC makes available 5 main types of textile ducts.

### 2.2.1 Circular ducts

Circular ducts are manufactured according to EUROVENT standard diameters. Different types of fastenings are available:

- Suspension by single galvanised or stainless steel cable.
- Suspension by double galvanised or stainless steel cable.
- Aluminium quick assembly mono rail Twist'n'FiX.
- Aluminium quick assembly double rail Twist'n'FiX.
- Mono strap + PVC profile



Circular ducts are mainly used when the height of ceilings allows it and when the whole volume of the premises to be treated is not monopolised by the activity that takes place there.

Circular ducts offer a particularly attractive « price per linear meter for a given flow » ratio.

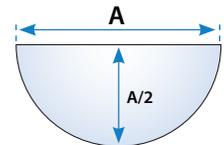
In order to meet certain constraints (geometry, dimension, congestion...), ATC are in a position to offer non-standard ducts diameters.

### 2.2.2 Semi-circular ducts

Semi-circular ducts are mainly used when the use of the premises requires low dimensions.

The suspension system, as well as the duct's shape, allow to save up to 40% space in terms of height, compared to a circular duct, for an equivalent flow.

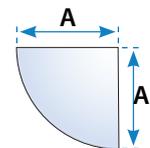
Semi-circular ducts installation requires a flat ceiling, with no obstacles (salient beam for instance). Fastening is then done through PVC profiles or aluminium rails.



### 2.2.3 Quarter-circular ducts

Quarter-circular ducts are made-to-measure according to need:

- installation at wall/ceiling intersections in the event of an horizontal positioning, or else within walls' angles in the event of a vertical positioning
- fastening by means of PVC profiles
- greatly-appreciated integration within the architectural environment of treated premises



### 2.2.4 Quarter ellipse

This particular design meets very specific requirements

### 2.2.5 Bow string or ½ ellipse

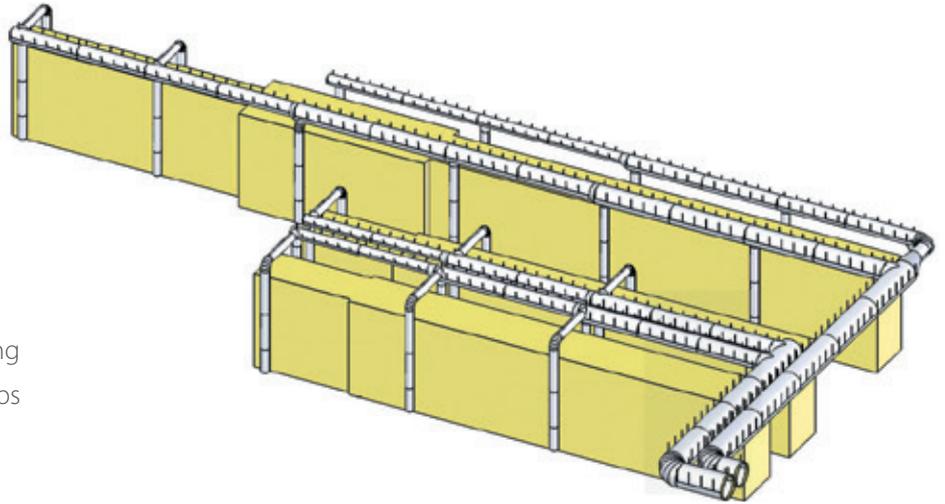
The 2 main reasons this type of shape is recommended are:

- Limiting crowding in terms of height
- Fastening on a fixed width (strips on false ceilings 600x600 mm for instance)

## 2.3 SUPPORTS AND ASSEMBLY PRINCIPLES

The choice of a suspension type must be made according to various criteria:

- Height of premises
- Aesthetic constraints
- Supply and installation costs
- Available position
- Possibilities offered by the building
- Congestion when ventilation stops
- Diffusers' shapes and sections



In order to keep textile ducts in good order and avoid their alteration, they should be protected during the building site's active phase.

This does not exclude prior assembly of their support structure.

Congestion values stated below are given as an indication and can vary according to the textile which is used.

### 2.3.1 Types of suspension

#### → Suspension through cables

This device is reserved for circular diffusers. It is the most common and the most economical, both in terms of supply and required installation time.

It is adapted to the widest range of constraints (fastening on wall or ceiling, change of direction and/or level...).

One must integrate, during the designing process, the position of anchorage points on which traction of around 250 kg may be exerted.

#### → Suspension through PVC or aluminium profiles

This device is essentially used for diffusers with a semi-circular section and quarter circle. It offers a continuous and accurate guide, by means of semi-rigid straps used as a link. It also ensures the necessary constraint of respecting the required shape.

The use of PVC or aluminium profiles implies assembly on smooth walls free from obstacles.

It is also possible to use rollers or travellers which ensure the link between the diffuser and the profiles.

→ **Suspension through rails (Alu Twist'n Fix)**

This device is essentially used for hanging designs. For instance, in a building 80 m long and 10 m high, in the middle of which we wish to place an 8 m long diffuser at a height of 4 m, it would be difficult to envisage stretching cables over such a length.

It is therefore preferable to use rails hanging from the roof, in the area to be treated. The link between the rail and the diffuser is ensured by means of trolleys, travellers or semi-rigid straps.

Suspension through rail allows diffusers to slide easily on a straight length, thus facilitating assembly and dismantling operations.

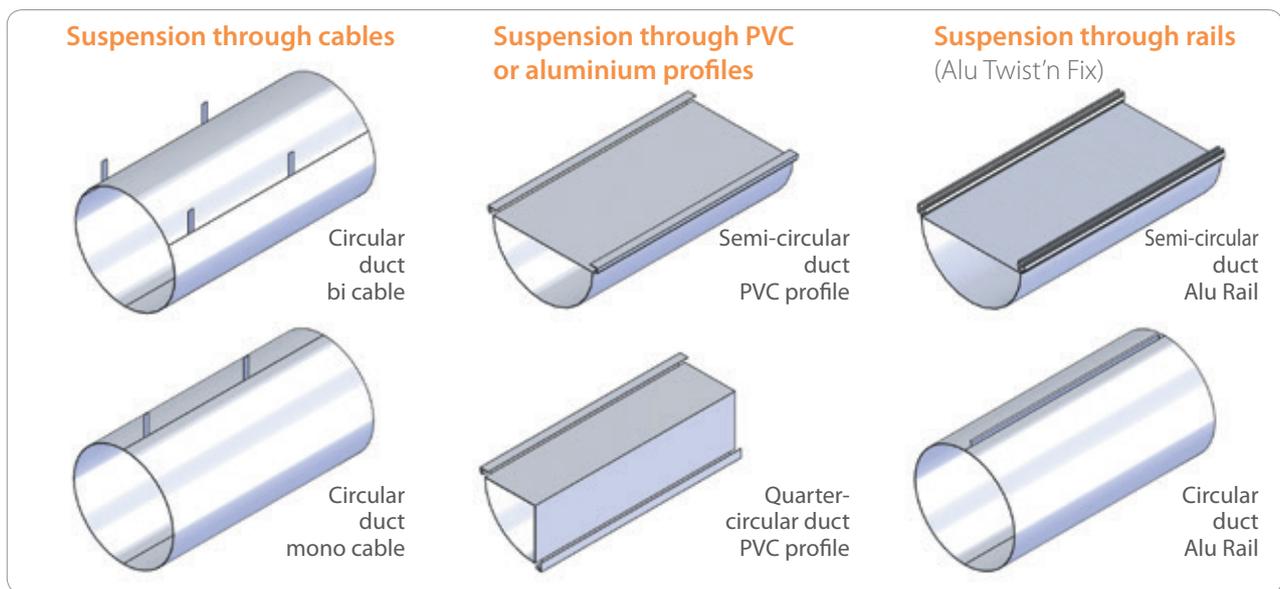


Diagram 6: different types of suspension

**2.3.2 Assembly accessories**

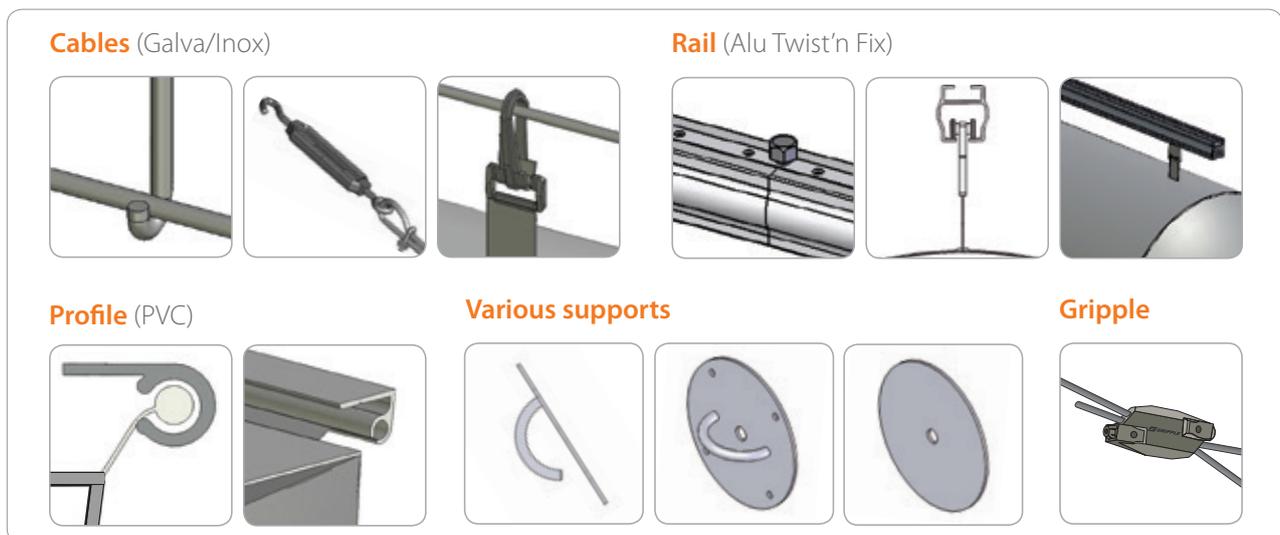


Diagram 7: assembly accessories

2.3.3 Technical files for different types of suspensions

→ Technical file simple suspension through cable

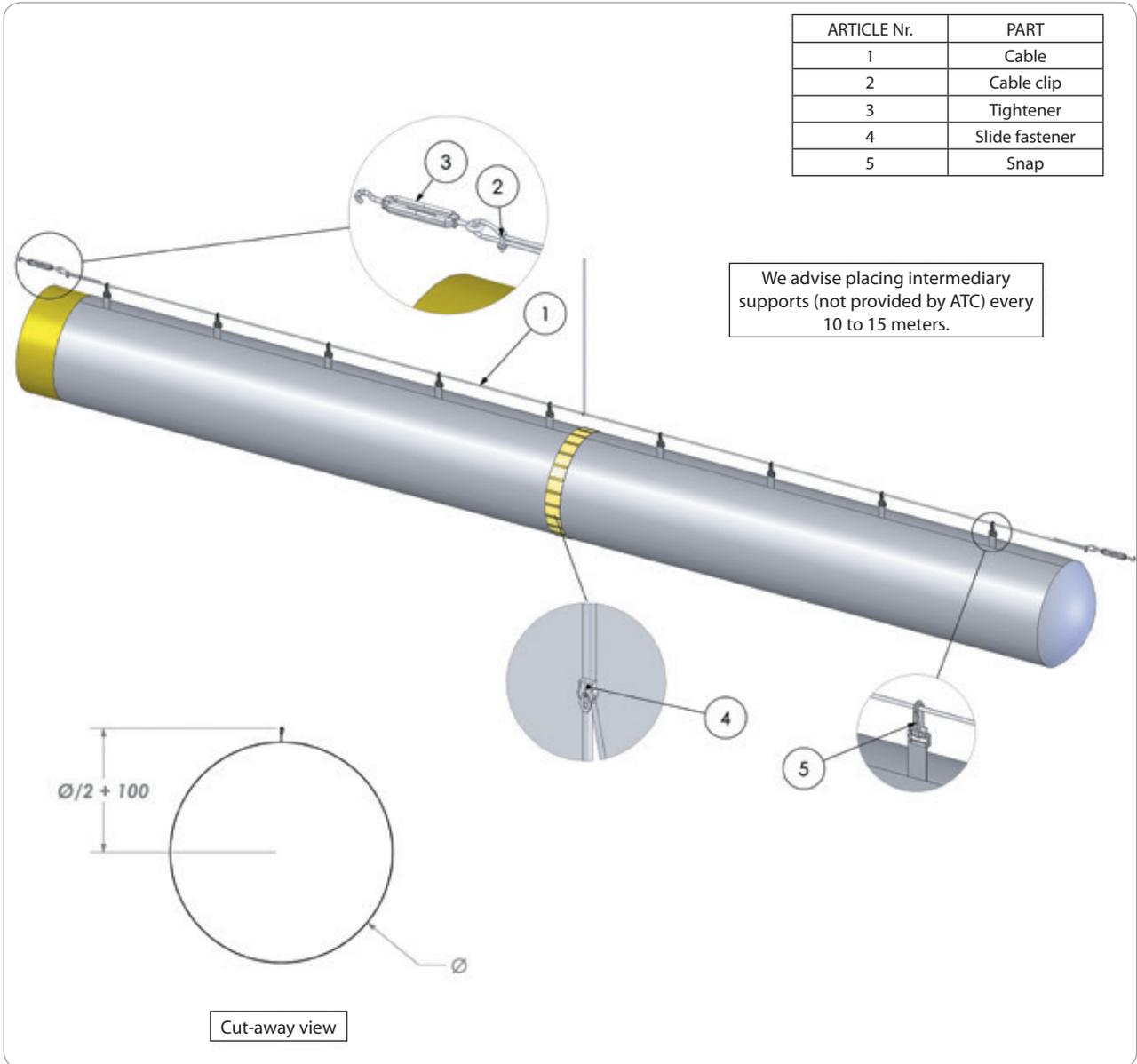


Diagram 8: Technical file simple suspension through cable

→ Technical file double suspension

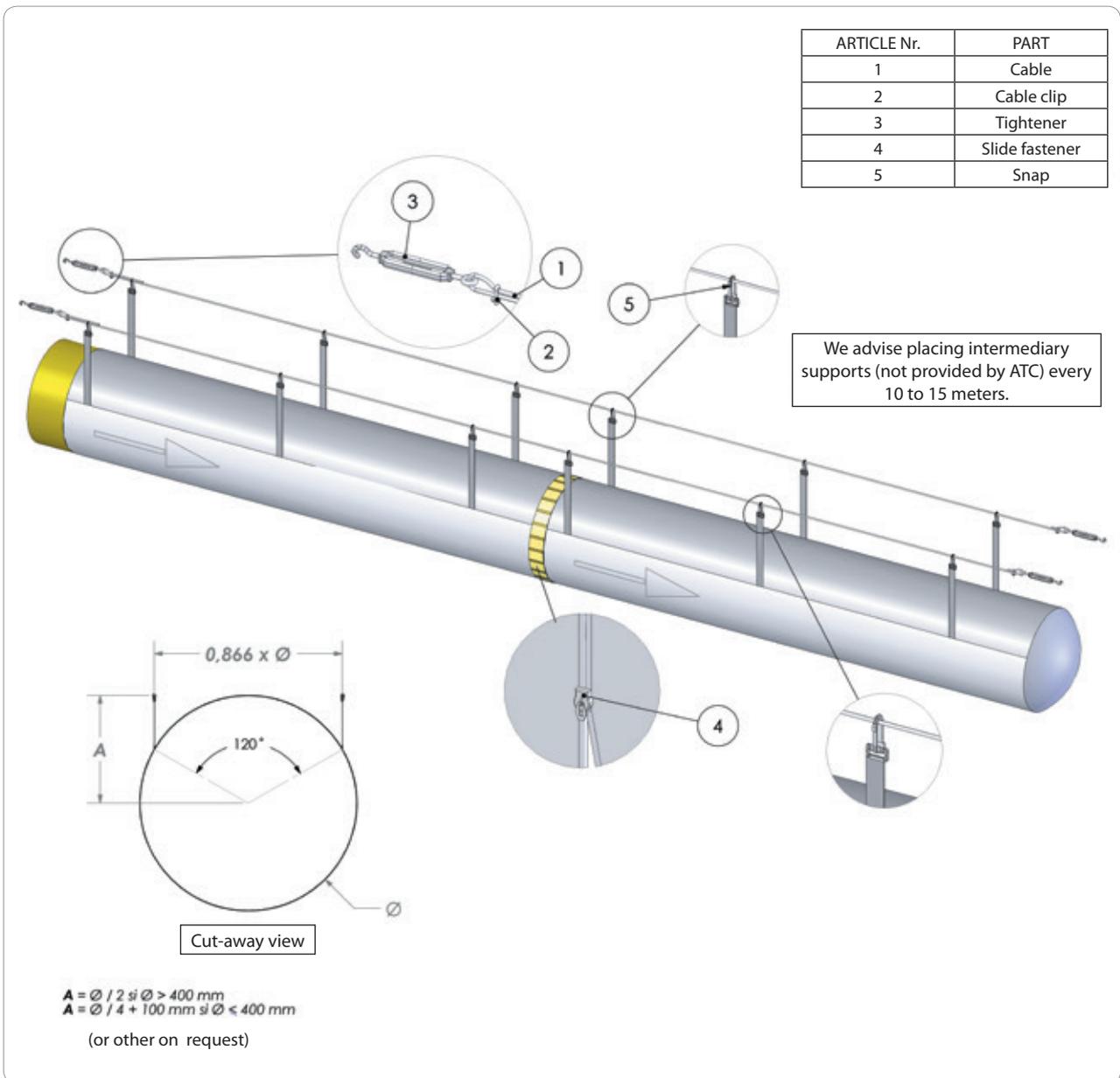


Diagram 9: Technical file double suspension at 120°

→ Technical file double suspension 180° long ties

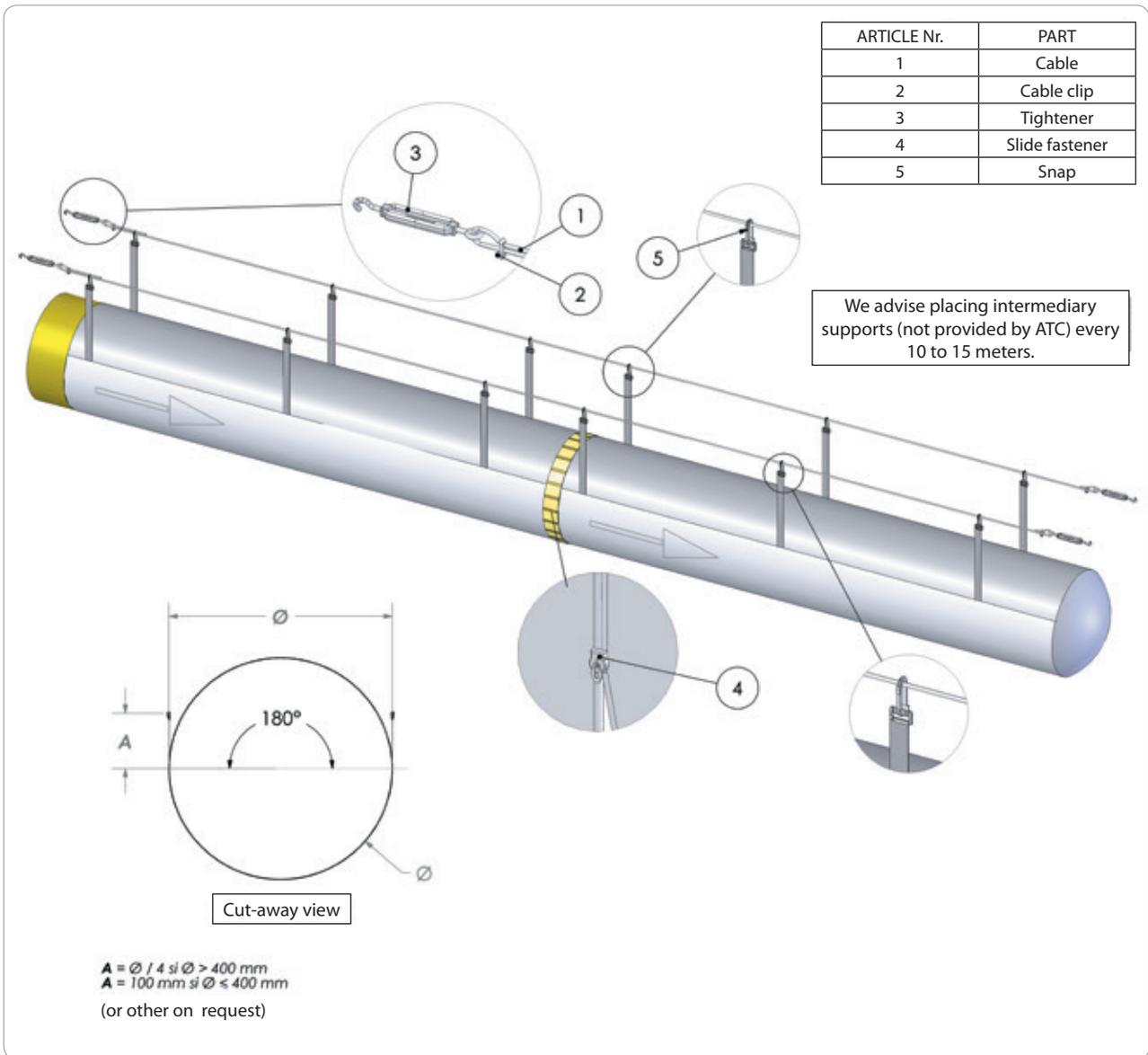


Diagram 10: Technical file double suspension 180° long ties

→ Technical file simple suspension through PVC profile

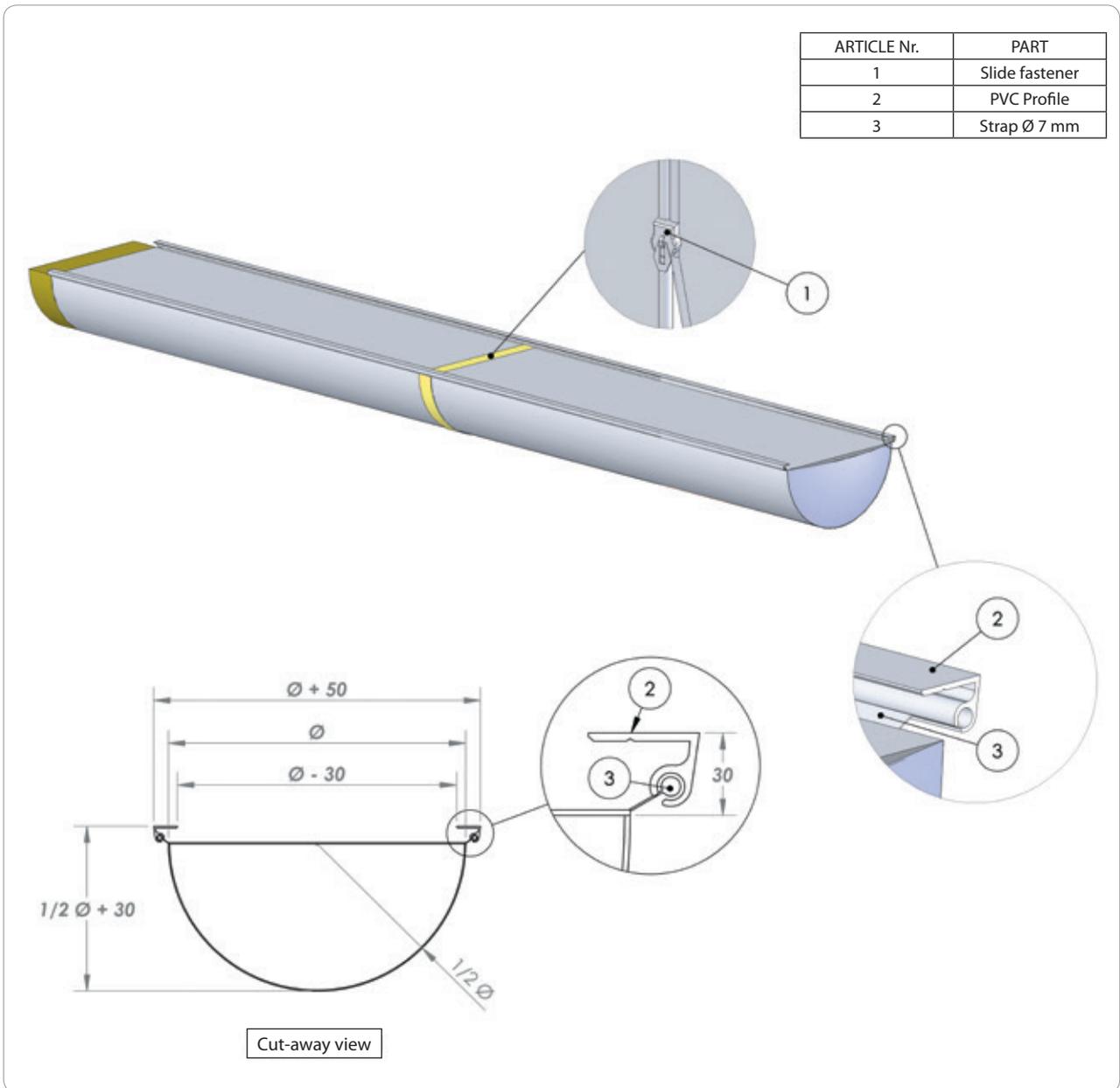


Diagram 11: Technical file simple suspension through PVC profile

→ Technical file simple suspension through alu profile

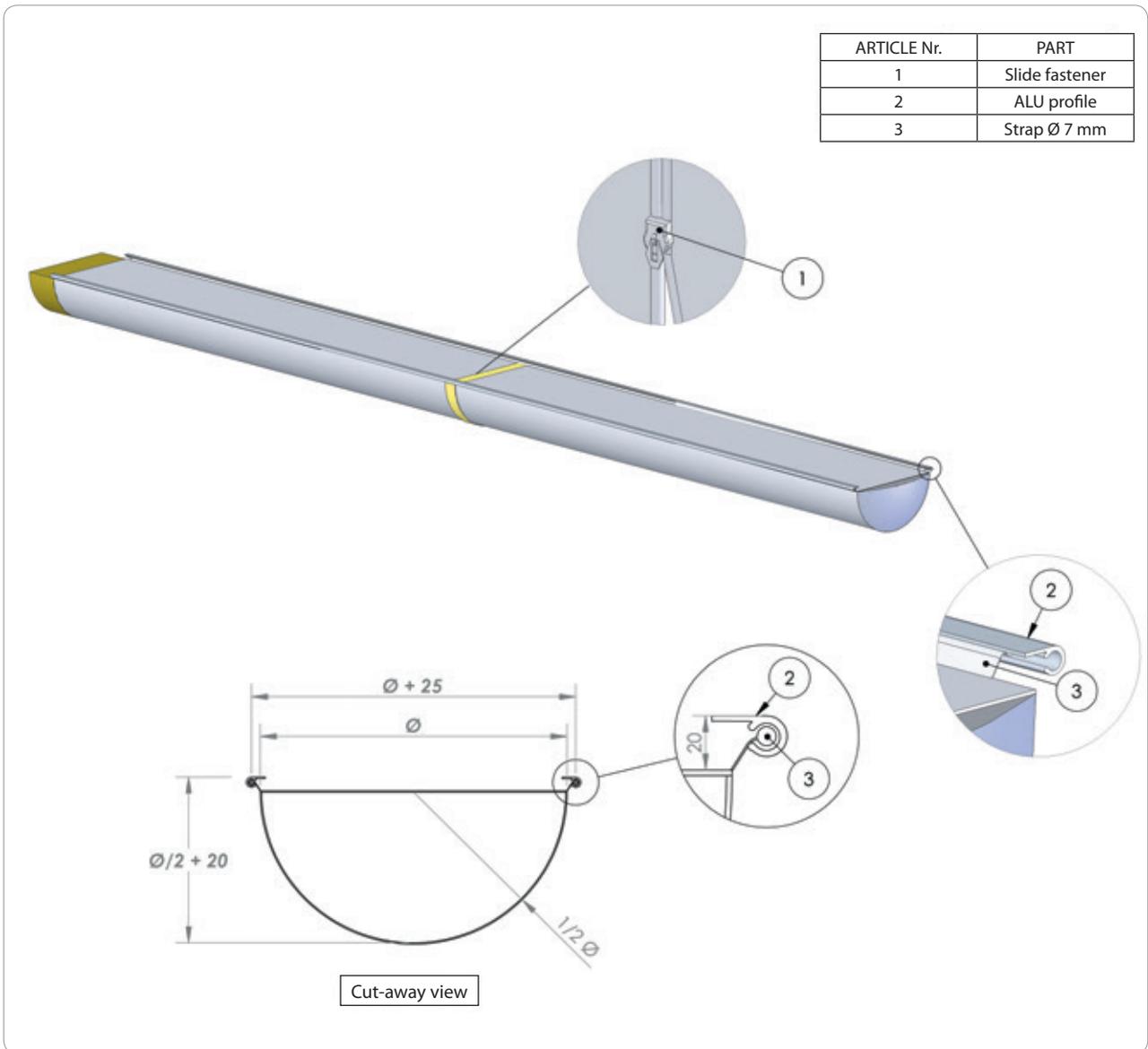


Diagram 12: Technical file simple suspension through ALU profile

→ Technical file suspension Alu mono rail + trolley

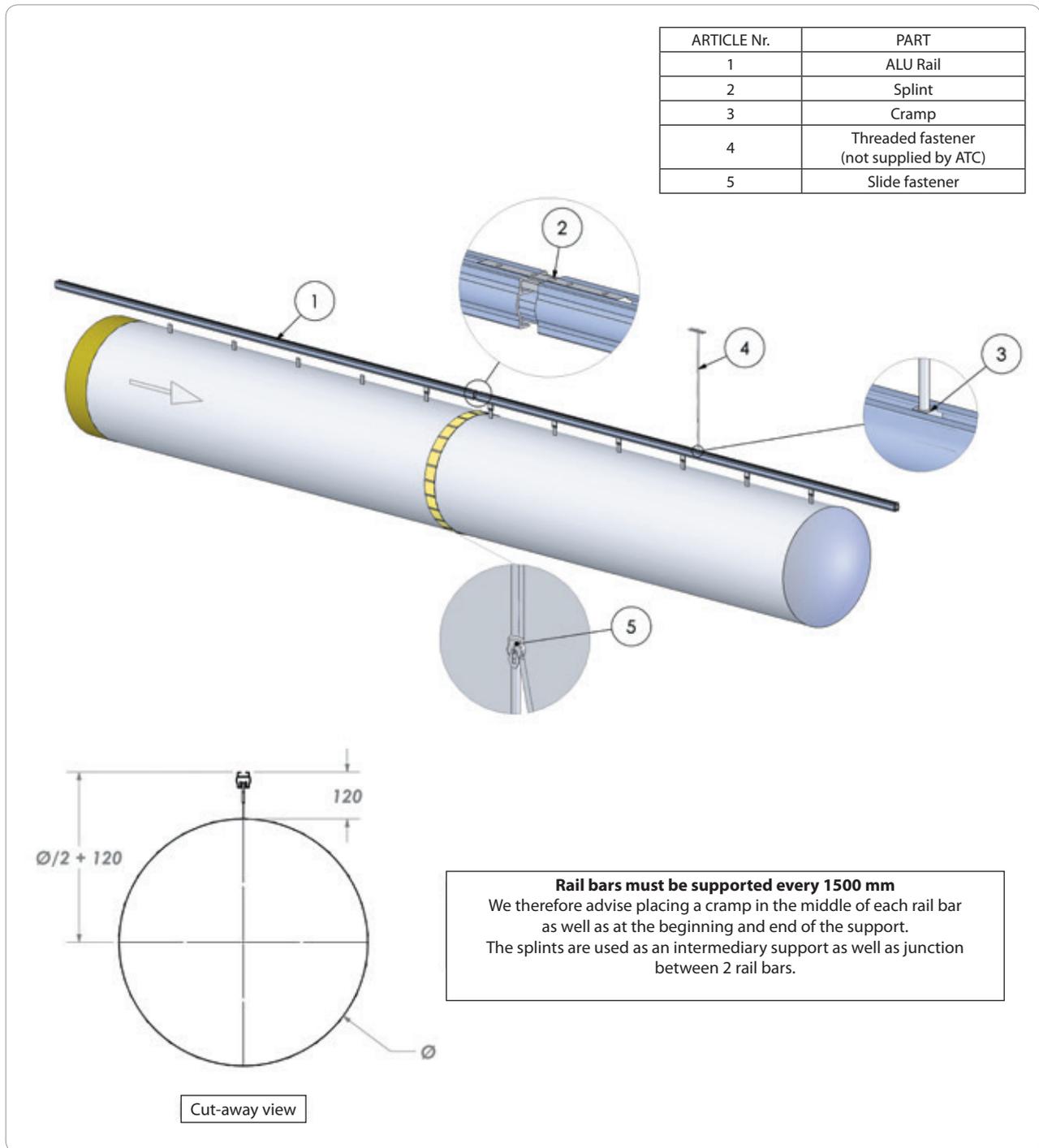


Diagram 13: Technical file suspension Alu mono rail + trolley

→ Technical file double suspension 1/4 circular

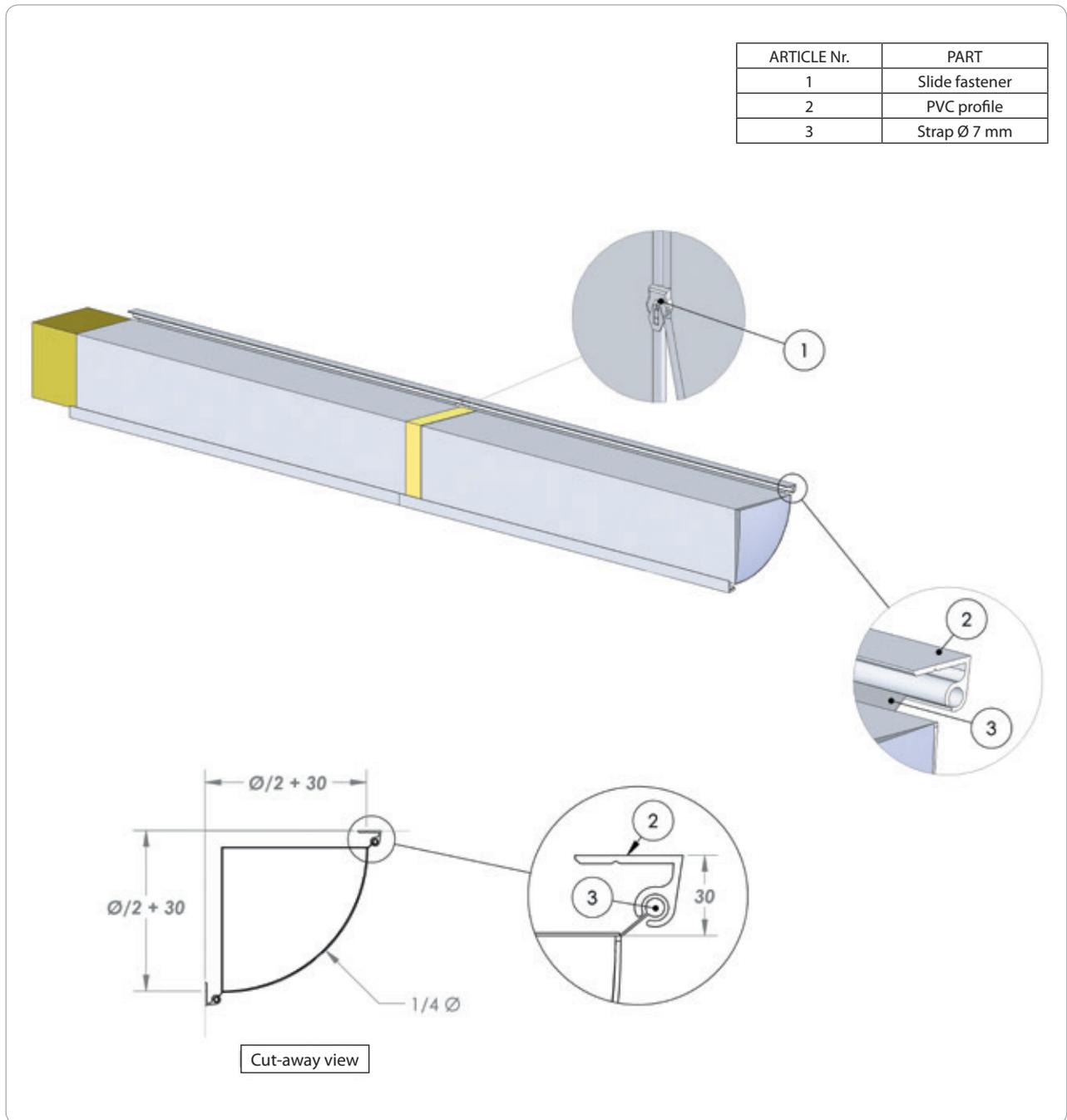


Diagram 14: Technical file double suspension 1/4 circular

### 2.3.4 Assembly instructions

#### → Assembly instructions for suspensions through cables

**Blowing side:** Mark and implant the anchorage points for the cables in relation to the hoop's axis (maximum effort: 250 kg traction). Then, mark and implant the opposite anchorage points making sure you observe perfect alignment with the duct's axis (horizontal and vertical). Implant the intermediary support, if possible adjustable in height, every 10 to 15 m. They only take up very little load, but allow to prevent sagging of the cables. Apart from exception, anchorage points and intermediary supports are not supplied as they depend on the building's structure.

Measure the length between your anchorage points and share out the cable reel(s) so that you can carry out the job with as few cuts as possible. If the cables are more than 20 m long, use two tighteners and flat cable clips. If not, use just one tightener and U-bolt clips. The tighteners must be loosened to the maximum beforehand. Wrap the cable with adhesive before cutting it so that it doesn't fray. Make a ball around the anchorage point away from the opposite side to the ring (or tightener). Unroll the cable towards the opposite anchorage point (ring side, using the intermediary supports to relieve the tension and create the second loop. Tense the cable with the tighteners.

**Precautions when assembling:**  
Stock the textile ducts away from dust on site. Wait for the end of all assembly work by various tradesmen in order not to expose the products to damage risks. Action the ventilation without the textile ducts in order to clean the networks (dust, debris...). Clear the cables from intermediary supports. Hang the duct by clipping the quick fasteners on the cables, starting from the opposite side to the ring. Assemble the different elements throughout the assembly with slide fasteners.

Set the reinforced collar on the ring and tighten firmly with the ratchet strap. Action the ventilation in order to tense the duct and, when it is in place, replace the cables into the intermediary supports. Check that the duct is not in contact with any wall or object that could damage it.

Diagram 15: Assembly instructions for suspensions through cable

→ Assembly instructions for suspensions through profiles

	<p>The use of PVC Type 1 profiles is exclusively reserved to smooth, flat and clear surfaces. You need to allow for a space of +/- 1 m between the end of the profiles and any drop in order to be able to slide the diffuser easily.</p> <p>Placing the profiles is done by taking as alignment mark:</p> <ul style="list-style-type: none"> <li>• The coupling ring axis</li> <li>• The profiles fastenings' axes</li> </ul> <p>Note: These axes are defined by the V-shaped slot engraved on the profile's base plate.</p>
	<p>According to the diffusers' dimensions, mark the axes of the v-shaped slots with a chalk line.</p>
	<p>Fasten the profile with wide cylindrical flat-headed self-tapping screws, rivets or else bolts.</p> <p>A perfect alignment of the profiles with each other is essential.</p> <p>To that effect, place a first screw in the slot 50 mm away from the profile's start, then another one at its end, whilst checking the alignment.</p> <p>Then, fasten a screw every 500 mm.</p>
	<p>Stock textile ducts and diffusers away from dust on site.</p> <p>Wait for the end of all assembly work by various tradesmen in order not to expose the products to damage risks.</p> <p>Action the ventilation without the textile ducts in order to clean the networks (dust, debris...).</p> <p>On the opposite side to the source of air, slide the duct into the profile(s). Assemble the different elements throughout the assembly with slide fasteners.</p>

Diagram 16: Assembly instructions for suspensions through profiles

→ Assembly instructions for suspensions through rails

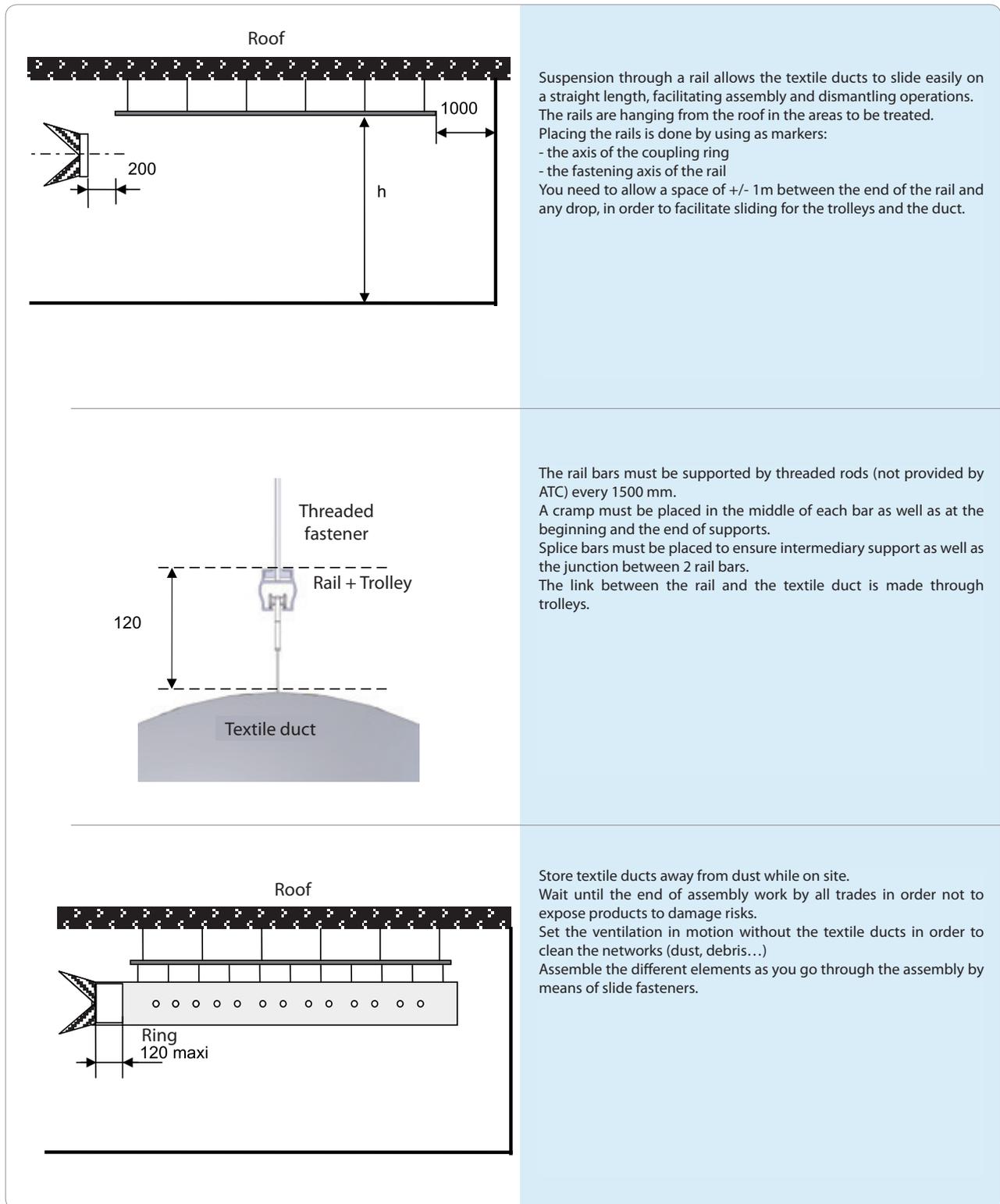


Diagram 17: Assembly instructions for suspensions through rails

### 2.3.5 Assembly time

The indications contained in the table below are only given as an order of idea:

Description	Installation time per meter (min/ml)	
	Lg < 15 m	Lg > 15 m
Simple suspension through cable	15	10
Double suspension through cable	20	15
Profile PVC/Alu	25	20
Mono rail Alu	20	15
Double rail Alu	25	20

Table 3: Installation time according to type of suspension

### 2.3.6 Usual Precautions

For each project, textile ducts and diffusers of the AIRNÉO range are the object of a specific study integrating the specifics and constraints of the installation, as known at the beginning of the manufacturing process.

Respect for trade practice is necessary to guarantee good durability for our products.

#### → During implementation

- Textile ducts and diffusers must be installed last during work on the premises. Where possible, place them only after all trades have intervened on the site.
- Take care to unpack and install AIRNÉO products in a clean location.
- Take particular care that no flame, incandescent item (welding) or other hot element should be in contact with the ducts and textile diffusers.
- Avoid any contact with rotating and/or moving elements. Particularly watch out for lifting equipment, gantries ...

### 2.3.7 Commissioning

- Check that no element is in contact with the textile ducts and diffusers (struts, supports, walls, beams, cable racks, pipes, etc.). If the environment does not allow to modify these constraints, contact your ATC representative in order to consider a local protection.
- Check, during inflation, that the ties are not subject to excessive constraints (tie place on the wrong side of an intermediary support for instance).
- Check blowing temperatures, static pressure at entry into the duct, and control conformity in relation to the values noted and transmitted to **ATC** for the study.
- Verify good stability of the network and that the duct does not generate knocking or floating.

In order to protect the product from a hammering effect, it is recommended, beyond 15 000 m<sup>3</sup>/h, to bring pressure gradually into the textile ducts and diffusers. As soon as the flow is above 20 000 m<sup>3</sup>/h, this recommendation becomes compulsory.

For our product **AIRNÉO Gold**, a gradual start is compulsory.

Several gradual starting system can be implemented:

- 2-speed motor with phased start at low speed
- Electronic starters
- Frequency converters
- Motorised damper with limit switch actuator, so that the fan starts with the damper shut. In this case, the damper's opening must be as slow as possible (150 to 180 sec)

### 2.3.8 During the 1st month in service

- Regularly check the state of cleanliness or clogging of the installed products in order to determine cleaning cycles and to guarantee the installation's optimum performance.
- Check the clogging rate in the air homogenisation cones situated at the network's start and/or after bends and connections.

As soon as a potential tear or any deterioration appears, it is highly recommended to send the affected station back to our workshop for repairs in order to avoid further alteration to your network.



# Calculation of aeraulics network by atc



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To fight against stratification and promote homogenisation of atmospheres, determination of a textile diffuser requires taking into account a number of parameters, amongst which:

- Total diffused
- Diffuser's diameter
- Static pressure available at diffuser's entrance
- Diffusing length
- Height of diffuser's implantation in relation to ground
- Range needed to treat the area
- Ambient and blown air temperatures
- Objective of air treatment

### 3.1 DIMENSIONS FOR NETWORK

#### 3.1.1 Diameter, dynamic pressure and frontal speed

The duct's diameter is determined using Diagram n°18. According to the total air and the speed, a duct's diameter is determined in the relevant area.

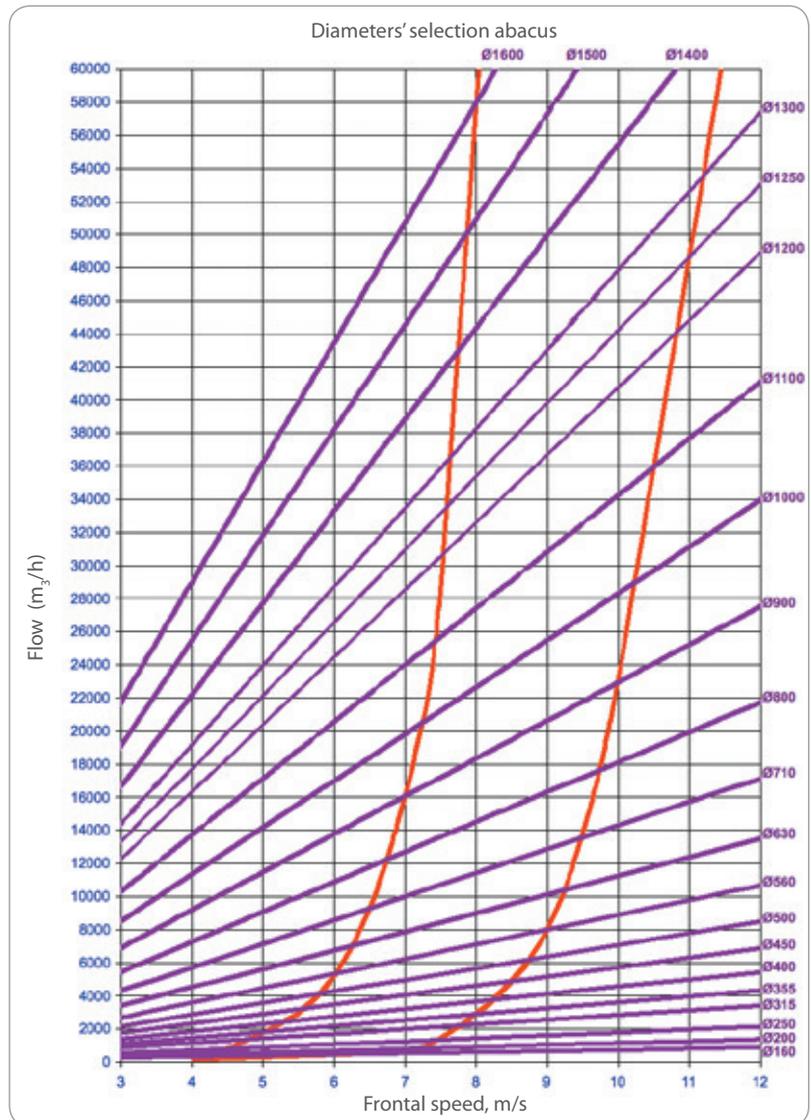


Diagram 19: ducts' diameter according to speed and flow

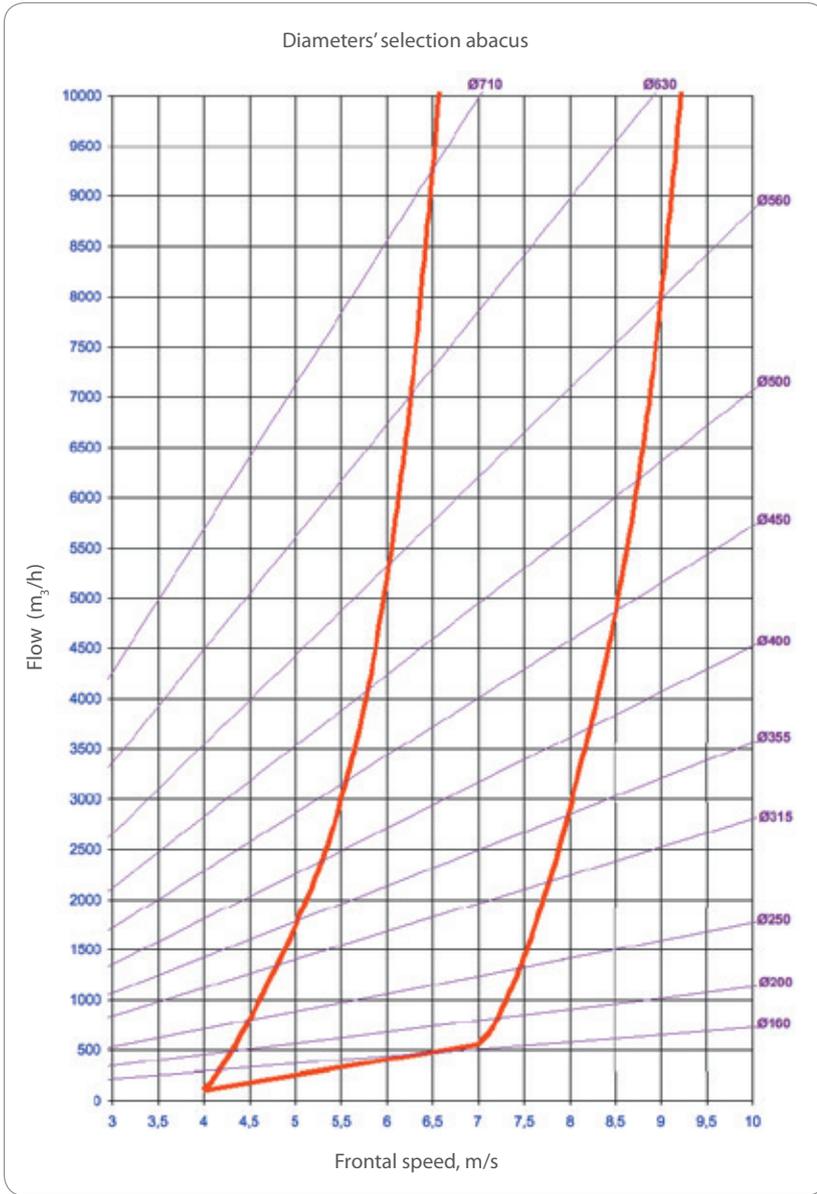


Diagram 19: ducts' diameter according to speed and flow

### 3.1.2 Losses of charge

Calculation of losses of charge for a textile ducts network differs very little from that for a classic rigid network.

When designing a textile ducts network, it is very important to take into account all of the following precautions:

- Reduce frontal speeds in order to limit losses of charge
- Balance frontal speeds within the same network
- Privilege straight ducts for installations with low static pressure
- Avoid as much as possible elbows and/or connections with acute angles
- Design symmetrical networks

Static pressure is given according to frontal speed in Diagram n°20. To ensure stability and balance for the aeraulics network, static pressure must at least be 2.5.

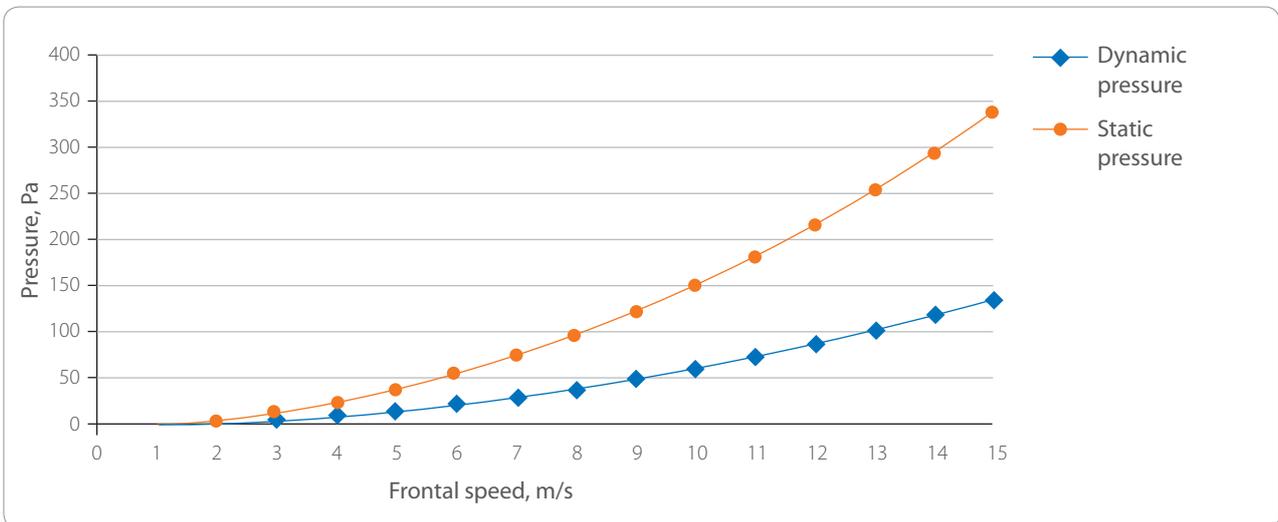


Diagram 20: static and dynamic pressure according to speed

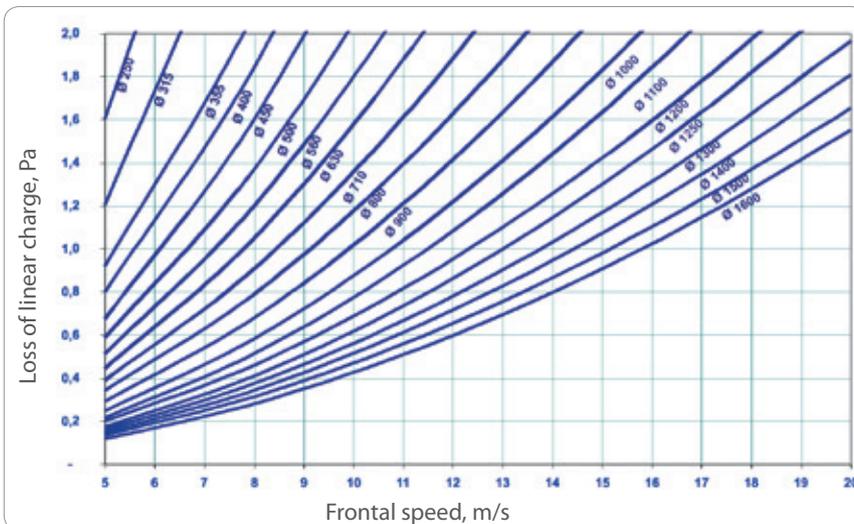


Diagram 21: linear losses of charges

During diffusion, total pressure remains almost constant along the textile duct. Static pressure rises in inverse proportion to dynamic pressure at losses of linear charges (Cf. Diagram n°21).

### 3.1.3 Speed limitations

When manufacturing complex aeraulics networks, we need to take into account speed limitations, in order to remedy problems of:

- Sound levels
- Knocking of ducts
- Alteration to ducts

On diagrams 22 and 23, red areas correspond to air speed profiles in the ducts. Dotted areas correspond to possible knocking and shape alteration with the static pressures currently available.

#### → On circular networks ( $V_{max} = \text{Max. speed}$ )

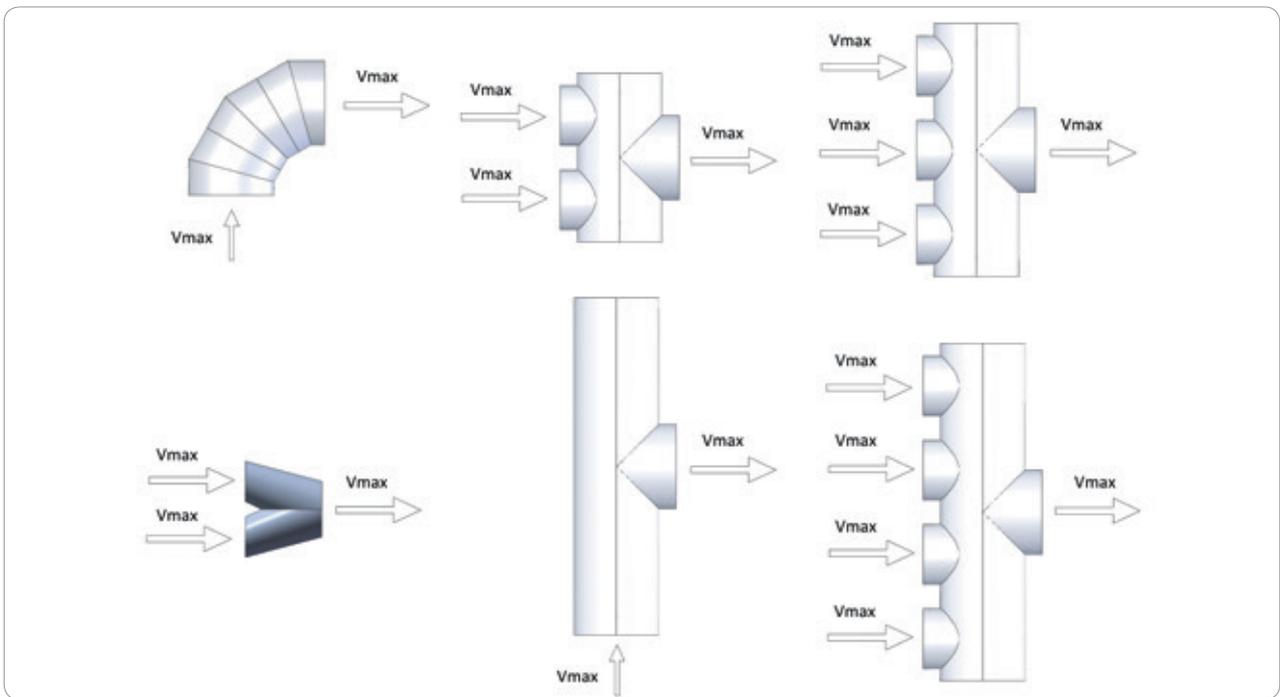


Diagram 22: Speed limitation in special sections of circular networks,  $\text{Max.Speed} = 7 \text{ m/s}$

#### → On semi-circular networks

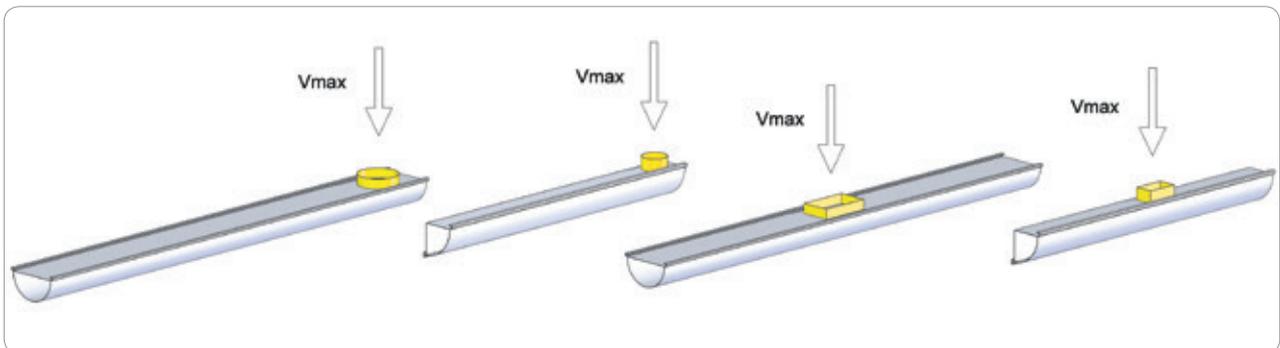


Diagram 23: Speed limitation in special sections of semi-circular, quarter-circular and elliptical networks,  $\text{Max.Speed} = 4 \text{ m/s}$ .

## 3.2 ACOUSTICS

In some applications, acoustics is a crucial criterion of quality for aeraulics networks. (Cf. Table 4). In practice, in working areas, ventilation must not cause discomfort as a result of, for example, speed, temperature, dampness of air and regenerated noise.

Types of premises	ISO level	Sound sensation	Level of sound pressure dB(A)
Recording studio	10 - 20	Very quiet	25
Conference hall, meeting room, theatre, cinema, library, hotel	30	Quiet	35
Office, classroom, lab	35	Quiet	40
Restaurant, shop	40	Quiet	45
Workshop, industry, sports premises	50	Moderate	55

Table 4: Standards and Sound levels

Discomfort due to noise depends on the combination of sound levels in each octave band. If necessary, ATC are in a position to supply the acoustic spectre of each diffuser and to give the acoustic power at source. From these weighted acoustic powers (A), the consultant will be able to take the necessary moderating measures (see example)

Duct diameter, Ø [mm]	450
S duct [m <sup>2</sup> ]	0,2
Frontal speed, Speed [m/s]	7,4
Pressure, P [Pa]	250
Flow [m3/h]	4 229
Global level, Lw [dB(A)]	57,3 ± 4 dB(A)

Average frequency. octave (Hz)	63	125	250	500	1000	2000	4000	8000
Weighting (A)	-26	-16	-9	-3	0	1	1	-1
Regeneration Lw in dB (Lin)	41,65	39,46	39,52	41,79	48,82	49,37	45,08	36,39
Regeneration Lw in dB (A)	15	23	31	39	49	51	46	35

Table 5: example of a circular duct's acoustic spectre

Regenerated noise is essentially created by:

- air speed (duct's diameter)
- turbulence due to network's special sections (elbows, connections...).

Attenuation of regenerated noise in the textile network is linked to:

- air expansion (attenuation of low frequencies)
- reverberation (in the presence of special sections, part of the sound wave is reflected upstream)
- absorption (very good absorbant in medium and high frequencies)
- transmission through walls

Thus, sound level is expressed according to flow and pressure and integrates different attenuation and noise regeneration parameters.

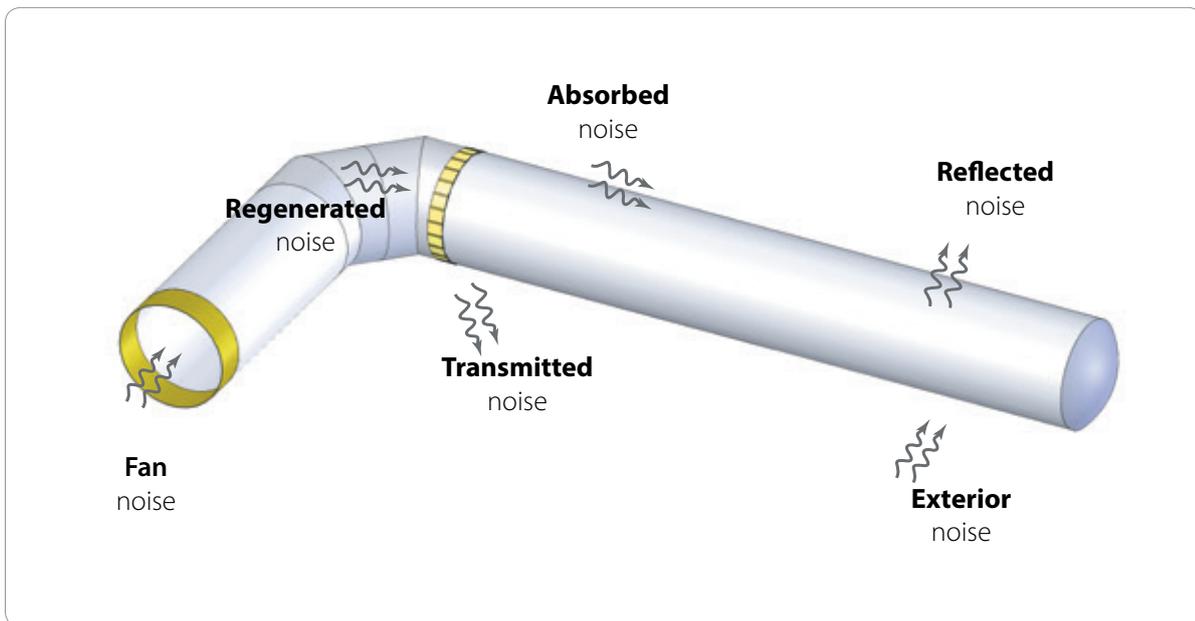


Diagram 24: propagation of noise in the aeraulics network

## 3.3 DIGITAL SIMULATION

For specific applications, or on request from the client, ATC can provide a CFD (Computational Fluid Dynamics) digital calculation service. This offer is designed and developed for consultants as well as refrigeration and air conditioning installers in order to create a model of the result in its context and illustrate, for end users, the evolution of air speeds and temperatures in their environment.

The behaviour of air flows linked to conditioning processes can have significant repercussions on:

- air quality and thermal comfort (industry, services, event organising)
- products quality (food industry ...)
- respect of energy performance
- effectiveness of installation's operation

Digital simulation in fluids mechanics constitutes:

- a precious tool for assisting aeraulic and thermal design of air treatment installations
- an effective means of validation, ahead of the project, of the relevance and accuracy of the proposed aeraulic solutions.
- true added value to the securisation of air treatment and conditioning processes.

On the basis of simplified hypotheses, digital simulation allows to:

- visualise mapping of air speeds
- highlight areas of over- or under- ventilation.
- anticipate heat transfers.
- offer the most optimised technical solution

### → Check-list for a good diagnosis

For a good diagnosis of your needs and constraints, here are the necessary data for digital simulation:

- premises drawings (with ducts position, storage racks, machines...)
- position and dimensions of air recycling (as well as flow sucked in by each outlet)
- thermal audit (input and losses)
- blowing and atmospheric temperatures wished for
- flow/ static pressure for each textile duct
- objective of air treatment (state the application)

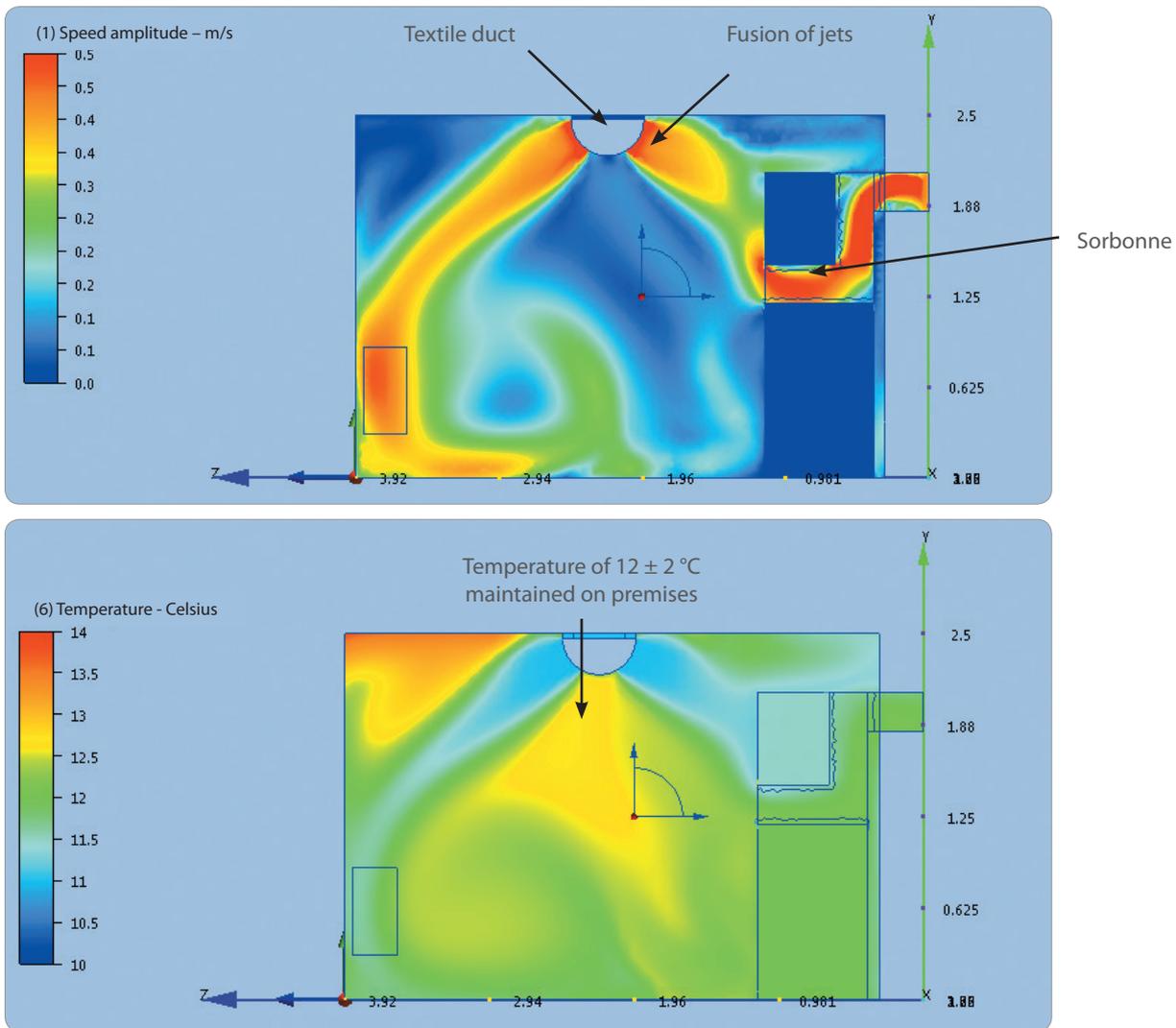


Diagram 25: example of air diffusion in a lab equipped with a Sorbonne

Physical parameters:

Ambient temperature, [°C]	12 ±2
Blown air temperature, [°C]	11
Static pressure, [Pa]	100
Available flow, [m3/h]	4000
Diameter of conduit, [mm]	½ 500
Supply to the duct	Through the middle at the top
Number of arcs	2

Diffusion by air movement

(Flow guided by extractions):

- Homogeneous temperature throughout the premises
- Low ejection speed
- Optimal comfort for staff present in lab.

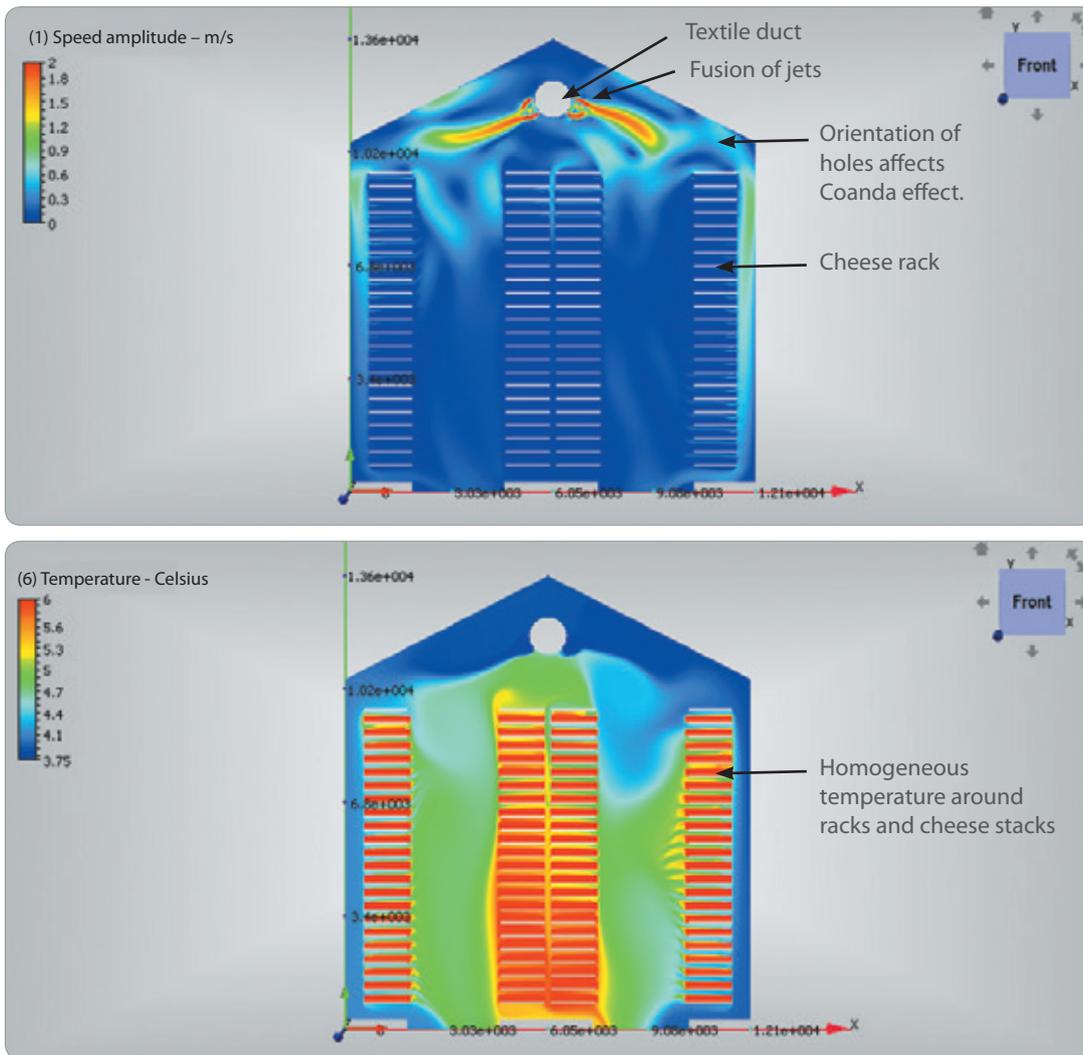


Diagram 26: example of simulation for a cheese dairy

Physical parameters:

Ambient temperature, [°C]	6
Ambient hygrometry, [%]	95
Dew temperature, [°C]	5,3
Blown air temperature, [°C]	3,75
Static pressure, [Pa]	100
Available flow, [m3/h]	25000
Diameter of conduit, [mm]	1100
Number of arcs	4

Blown air model in alleyways:

- Quasi-homogeneous temperature around pallets.
- diffusion with high induction and long range.
- Good air distribution between racks' top and bottom
- Air diffusion with Coanda effect.



# IV.

## AIRNÉO

### Products range



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## 4.1 AIRNÉO REFERENCE LT

### → Fields of applications

The **AIRNÉO Référence LT** range has been designed especially to answer perfectly the needs of following activity sectors:

- Food industry
- Industry
- Laboratories, White rooms
- Logistics
- Events organising
- Services

### → Material and characteristics

The **AIRNÉO Référence LT** duct is made of polyester, adapting to various air diffusion processes and offering the following characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- The 95 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 30 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
Référence LT	<b>Textile:</b> PES  <b>Weight:</b> 95 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1, B-s1-d0 Non classified	White Yellow 1023 Orange 2011 Red 3020 Blue 5005 Blue 5012 Green 6032 Grey 7040	ENERGY  IMPULSION  RADIANT  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	Recommended in most cases, except for public venues

Table 6: characteristics of AIRNÉO Référence LT ducts

## 4.2 AIRNÉO REFERENCE CLEAN ROOM

### → Fields of applications

The AIRNÉO **Reference CR** has been designed especially to answer perfectly the needs of following activity sectors:

- Laboratories
- White rooms

### → Material and characteristics

The **AIRNÉO Référence CR** duct is made of polyester, offering the following characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- Classification of white rooms from ISO 5 according to room flow, rate of air stirring and duct dimensions
- The 95 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 30 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
Référence Clean Room	<b>Textile:</b> PES  <b>Weight:</b> 95 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1 Non classified	White Yellow 1023 Orange 2011 Red 3020 Blue 5005 Blue 5012 Green 6032 Grey 7040	ENERGY  IMPULSION  RADIANT  HERMETIC	Profile PVC	Perfectly adapted to the needs of premises with « hygiene »: - small volume - high air stirring rate - air diffusion at low speed

Table 7: AIRNÉO Reference Clean Room ducts

## 4.3 AIRNÉO RÉFÉRENCE CS

### → Fields of applications

The **AIRNÉO Reference CS** has been designed especially to answer the Swiss and German requirements in terms of fire resistance. It is perfectly adapted to answer the needs of activity sectors:

- Food industry
- Industry
- Laboratories, White rooms
- Logistics
- Events organising
- Services

### → Material and characteristics

The **AIRNÉO Référence CS** duct is made of Trévira CS polyester material, offering the following characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- The 95 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 30 l/m<sup>2</sup>/s limits condensation
- Material classified M1 (France) - 5.2 (Switzerland) - B1(Germany) permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Référence CS	<b>Textile:</b> Trévira CS PES  <b>Weight:</b> 80 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1, 5.2-B1	White	ENERGY  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	Recommended in most cases, except for public venues

Table 8: AIRNÉO Reference CS duct

## 4.4 AIRNÉO REFERENCE ANTISTATIC

### → Fields of applications

The **AIRNÉO Référence AS** duct is designed to optimise safety in anti-explosion premises as well as premises containing precision instruments:

- dangerous premises (gaseous explosive substances...)
- Food industry (freeze-dried products)
- Electronics, motor, aeronautics industries...
- Hospitals (where oxygen is very often present)
- Laboratories (pharmaceuticals, biotechnology, optics...)

### → Material and characteristics

The **AIRNÉO Reference AS** duct is made of antistatic polyester, offering the following characteristics:

- Volumic electrical resistance (1,6 10E -9 Ohms) prevents the duct from loading in static electricity
- 80 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from -40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 30 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Référence AS	<b>Textile:</b> PES Antistatic carbon  <b>Weight:</b> 130 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1	White Grey	ENERGY  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	- Allows to suppress accumulation of static electricity - Ideally adapted to meet the requirements of aseptic processes in all sorts of industrial environments (food industry, electronics, pharmaceuticals, aeronautics, motor, etc).

Table 9: AIRNÉO Référence Antistatic duct

## 4.5 AIRNÉO REFERENCE ANTIBACTERIAL

### → Fields of applications

**AIRNÉO Reference AB** answers the most rigorous requirements in terms of hygiene and ease of cleaning. This product prevents the development of micro-organisms whilst preserving polyester's technical characteristics.

Fields of applications for the antibacterial duct:

- All technical fields
- Food industry (ripening, conditioning...)
- Grey rooms
- White rooms
- Pharmaceutical labs

### → Material and characteristics

The **AIRNÉO Reference AB** duct is made of Trévira CS polyester material, offering innovative characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- The weight of 100 g/m<sup>2</sup> facilitates installation
- A smell inhibitor allows to avoid, over time, the development of smells due to bacteria
- A special and unalterable agent is directly integrated into the fibres of bioactive Trévira. This additive acts permanently against microbes and is not altered either by washing or by wear and tear.
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 30 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Référence AB	<b>Textile:</b> PES Trévira CS antibacterial  <b>Weight:</b> 100 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1 - B1	White 9010	ENERGY  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	- Permanent antibacterial agent. - Particularly recommended for high hygrometry atmospheres (increased mould growth) or premises with dust control.

Table 10: AIRNÉO Référence antibacterial duct

## 4.6 AIRNÉO GOLD

### → Fields of applications

**ATC** offer their **AIRNÉO Gold** answering the criteria of current French legislation (14th February 2000 Act, article CH14, §1). AIRNÉO Gold ducts are made of M0 class and perfectly suited to public venues, such as:

- Retail areas
- Airports
- Exhibition halls

### → Material and characteristics

The **AIRNÉO Gold** duct is made of glass cloth coated with M0 polyurethane presenting the following characteristics:

- Non-combustible
- Low permeability material: diffusion takes place at very high speed through rows of calibrated perforations
- Not washable: possibility of dusting
- Gradual start required
- Ducts can be customised on white substrate: marking (logos, advertising messages, identification by code...)

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Gold	<b>Textile:</b> Glass Polyurethane  <b>Weight:</b> 450 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M0	<b>Colours:</b> White Grey Black	ENERGY  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	Compulsory in French public venues.

Table 11: AIRNÉO Gold range

## 4.7 AIRNÉO FIRST

### → Fields of applications

For complex and lengthy ventilation networks, ATC offers the **AIRNÉO First** duct which is perfectly suited to the needs of applications such as:

- Food industry
- Industry
- Laboratories, White rooms
- Logistics
- Events organising
- Services

### → Material and characteristics

The **AIRNÉO First AIRNÉO Référence LT** duct is made of polyester, adapting to various air diffusion processes and offering the following characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- The 220 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 4 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO First	<p><b>Textile:</b> PES</p> <p><b>Weight:</b> 220 g/m<sup>2</sup></p> <p><b>Fire resistance classification:</b> M1 ; B-s1-d0 Non classified</p>	<p><b>Colours:</b> White Blue Grey</p>	<p>ENERGY</p> <p>IMPULSION</p> <p>RADIANT</p> <p>HERMETIC</p>	<p>- Mono cable</p> <p>- Bi-cable</p> <p>- Profiles</p> <p>- Aluminium rails Twist'n'Fix</p>	<p>Produced mainly to be used in applications with constraints: great length, low flow... Table 12: AIRNÉO First range</p>

Table 12: AIRNÉO First range

## 4.8 AIRNÉO CLASSIC

### → Fields of applications

The **AIRNÉO Classic** is perfectly suited to chlorinated or damp atmospheres:

- Industry
- Logistics

### → Material and characteristics

The **AIRNÉO Classic** duct is made of glass cloth coated with PVC on both faces, presenting the following characteristics:

- 100 % watertight material
- Good mechanical resistance over time
- Ease of installation
- Material resisting temperatures ranging from - 5°C to 60°C.
- Material classified M1 ie. hard to set fire to

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Classic	<b>Textile:</b> Coated glass PVC  <b>Weight:</b> 420 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1	<b>Colours:</b> White Grey	ENERGY  HERMETIC	- mono cable - bi cable - profiles - aluminium rails Twist'n'Fix	Product mainly used in chlorinated atmospheres.

Table 13: AIRNÉO Classic range

## 4.9 AIRNÉO LUMEN

### → Fields of applications

Through integration of a light source, the **AIRNÉO Lumen** allows highlighting of your advertising messages.

This product offers additional light in your premises:

- Reception hall
- Services
- White rooms
- Laboratories
- Event organising (provided no demand in MO)
- Storage premises

### → Material and characteristics

The AIRNÉO Lumen duct is equipped with a differential pressure switch permitting a power supply of the light source.

According to the thermal treatment, two types of light sources are offered:

- LED ribbon
  - Limited use of space, easy assembly
  - Blowing temperature between 5 °C and 20 °C
  - Limited length (10 m), cutting meter/meter possible
  - 24V supply (transformer supplied as well as associated cables)
  - Operating time around 50 000 h below 20 °C
- Fluorescent tube
  - Strong light possible
  - Blowing temperature between 15 °C and 50 °C
  - Slide fastener for lookout from above
  - Supply in 220V

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Lumen	<b>Textile:</b> PES Ripstop  <b>Weight:</b> 95 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1	White	ENERGY  HERMETIC	<b>Textile duct with LED ribbon:</b> Mono-suspension  <b>Textile duct with fluorescent tube:</b> Bi-suspension / Mono-suspension	The AIRNÉO Lumen duct contributes to highlighting printed logos through an integrated light source.

Table 14: AIRNÉO Lumen range

## 4.10 AIRNÉO ISOTEX

### → Fields of applications

For financial and environmental reasons, ventilation ducts require thermal insulation.

In order to limit condensation and reduce energy losses in air treatment and conditioning networks, ATC offer their new **AIRNÉO Isotex** range with a suitable insulation solution.

The **AIRNÉO Isotex** duct transports both hot and cool air and can be used in premises heated or not (attic space...).

### → Material and characteristics

The **AIRNÉO Isotex** duct comprises a washable textile duct (internal) and an insulating multi-layer (external).

The external insulating duct is characterised by:

- Complex including a polyester wadding layer
- Thermal resistance = 0,227 m<sup>2</sup>.K/W
- Thermal conductivity  $\lambda$  = 0,04 W/m<sup>2</sup>K
- Thickness = 10 mm
- Operating temperature from - 40 °C to +130 °C
- Easy assembly / Dismantling
- Faultless hygiene

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Isotex	<b>Textile:</b> PES PES WADDING ALUMINIUM  <b>Weight:</b> 480 g/m <sup>2</sup>  <b>Fire resistance classification:</b> Non classified	<b>Colour:</b> Aluminium	HERMETIC	- Bi cable - Bi- Aluminium Rails Twist'n'Fix	- The AIRNÉO Isotex duct is composed of a polyester duct and an insulated duct. - Low thermal loss. - Limited condensation

Table 15: AIRNÉO Isotex range

Note that, according to conditions, it is possible that insulation is not sufficient to avoid a condensation phenomenon: consult ATC for any request for AIRNÉO Isotex duct.

### Example of application:

Insulated ducts installed in a mushrooms producer's attic space where operating conditions are:

- O circular 1300 mm duct.
- $Q = 35000 \text{ m}^3/\text{h}$ .
- Duct length = 24 m.
- $T^\circ\text{C}$  in attic space =  $35^\circ\text{C}$ .
- Relative humidity in attic space = 40%.
- Dew point  $T^\circ\text{C} = 19,4^\circ\text{C}$ .

According to AIRNÉO Isotex characteristics and blowing conditions:

- Blowing  $T^\circ\text{C} = 13^\circ\text{C}$
  - Blowing relative humidity = 100%
  - $T^\circ\text{C}$  of external insulating surface =  $28^\circ\text{C}$
- There is no condensation risk.

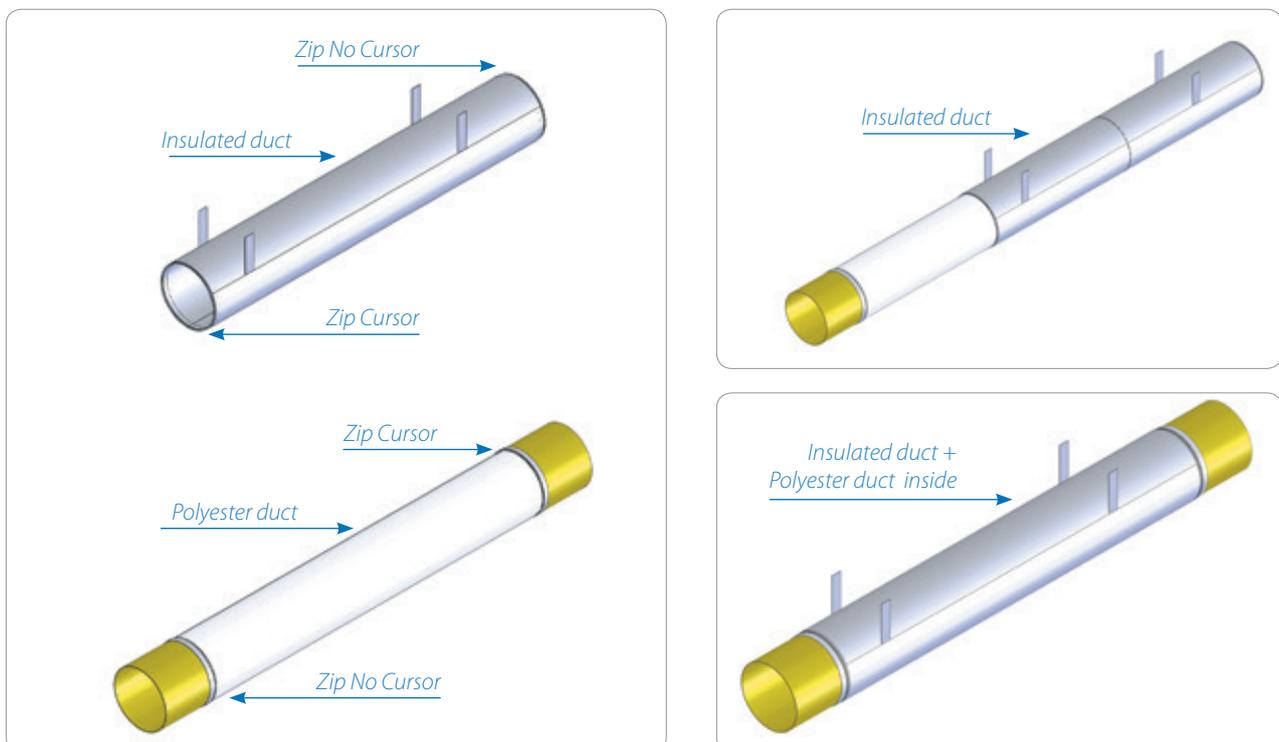


Figure 27: Isotex duct's diagrams: polyester duct and insulated duct assembled together with PVC zipper

## 4.11 AIRNÉO WALL

### → Fields of applications

An air curtain placed at the entrance of premises generates important energy savings:

- Conditioning of incoming air
- Reduction in heating expenses
- Elimination of time wasting in opening and shutting doors
- Improvement of all-round efficiency in heating premises

To this end, ATC offer the **AIRNÉO Wall** duct allowing to work important widths and heights that can go up to 6 meters.

On study, possibility of having greater heights.

### → Material and characteristics

The **AIRNÉO Wall** duct is made of polyester, offering the following characteristics:

- Well suited to this type of application (resistance to possible friction)
- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- The 220 g/m<sup>2</sup> weight facilitates installation
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- A leak rate of less than 4 l/m<sup>2</sup>/s limits condensation
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

For the **AIRNÉO Wall** suspension system, ATC offer the aluminium double rail «Twist'n'Fix » which presents several advantages:

- Possibility of easily retracting the duct if necessary
- Fastening to the building's structure more suitable than cable
- Limitation of duct's pendulum effect
- Limitation of space used when duct is deflated



Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Wall	<p><b>Textile:</b> PES</p> <p><b>Weight:</b> 220 g/m<sup>2</sup></p> <p><b>Fire resistance classification:</b> M1</p>	<p>White</p> <p>Blue 5005</p> <p>Grey 7040</p>	ENERGY	<p><b>Bi- suspension:</b></p> <ul style="list-style-type: none"> <li>- Bi cable</li> <li>- Aluminium rails</li> <li>Twist'n'Fix</li> </ul>	<p>The AIRNÉO Wall is perfectly suited to the following applications:</p> <ul style="list-style-type: none"> <li>- Very great door height or width (workshops, factories, garages, hangars, warehouses, exhibition halls, etc.)</li> <li>- Automatic door opening (shops, hotels, chemists, hospitals, reception rooms, etc.).</li> </ul>

Table 16: AIRNÉO Wall range

Each air curtain must be set and adjusted according to its use.

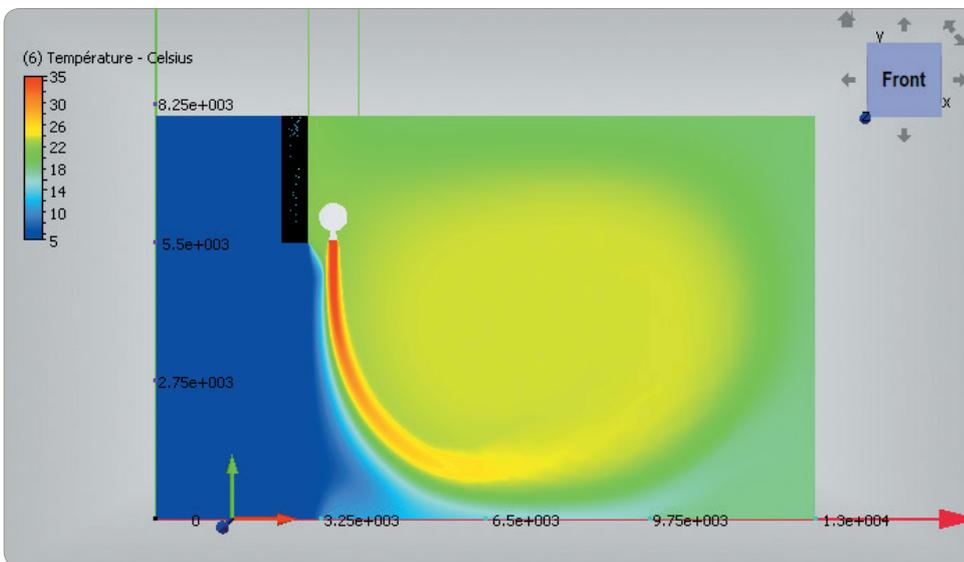


Figure 28: AIRNÉO Wall, temperature mapping in winter mode

## 4.12 AIRNÉO WARM UP

### → Fields of applications

In commercial refrigeration or low temperature storage applications, it is indispensable to cover the exits of air coolers (or evaporators) to avoid warm air circulation during defrosting cycles.

In this context, ATC offer the **AIRNÉO Warm Up** duct which allows a reduction of defrosting cycle times and obtain an energy saving.

### → Material and characteristics

The **AIRNÉO Warm** duct is made of polyester, offering the following characteristics:

- The Ripstop canvas allows to avoid a tear extending after a snag and guarantees very good mechanical resistance over time
- Resisting temperatures from - 40°C to 130°C, the material can be used in both negative and very hot atmospheres
- Material classified M1 permanent ie. « hard to set fire to »
- Washable material
- Ducts can be customised: specific colours, marking (logos, advertising messages, identification by code...)

For the guarantee to be applicable, it is essential to allow for air rectifiers (anti-vortex) at fans' exits.

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Warm Up	<b>Textile:</b> PES  <b>Weight:</b> 95 g/m <sup>2</sup>  <b>Fire resistance classification:</b> M1	White Yellow 1023 Orange 2011 Red 3020 Blue 5005 Blue 5012 Green 6032 Grey 7040	HERMETIC  DIFFUSION: IN BULKC	Reinforced collar for assembly on standard ring.	AIRNÉO Warm Up is a textile defrosting sleeve allowing:  - to avoid any release of damp into the atmosphere.  - to reduce defrosting times by 30 %

Table 17: AIRNÉO Warm Up range

## 4.13 AIRNÉO CURVE

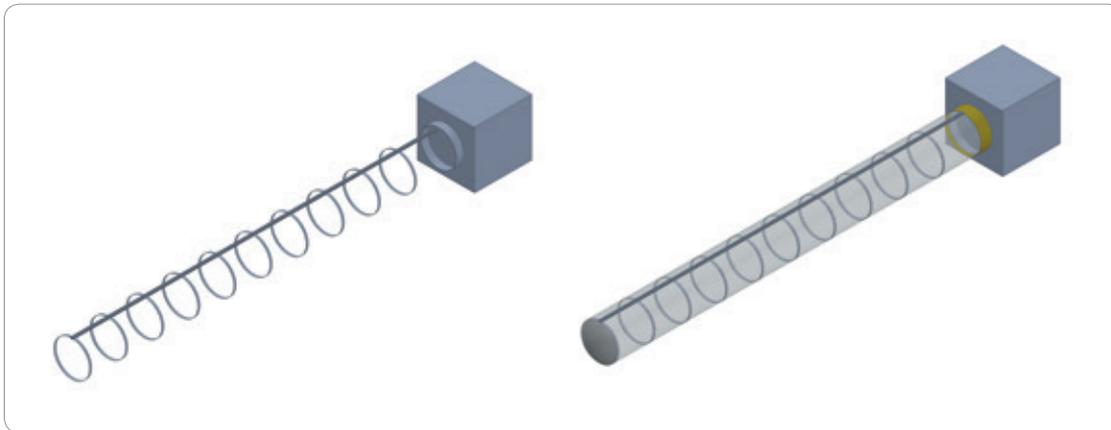


Figure 29: basic diagram for AIRNÉO Curve range

### → Fields of applications

With its hooped structure, the **AIRNÉO Curve** duct can keep its circular aspect even at rest. This product offers an aesthetic plus in your premises:

- Reception halls
- Retail units
- Airports
- Exhibition halls
- Services
- Events organising
- Storage premises

### → Material and characteristics

Trade name	Material	Standard colours	Type of diffusion	Type of suspension	Observations
AIRNÉO Curve	<p><b>Textile:</b> AIRNÉO range of materials (PES, Glass, Coated PVC, Glass / Polyurethane)</p> <p><b>Weight:</b> 95- 400 gr/m<sup>2</sup></p> <p><b>Fire resistance classification:</b> 95- 400 gr/m<sup>2</sup></p>	<p><b>Colours:</b> yes</p> <p><b>Screen printing:</b> according to material used</p>	<p>ENERGY</p> <p>IMPULSION</p> <p>RADIANT</p> <p>HERMETIC</p>	Specific aluminium rails	<p>- Thanks to its hooped structure, the AIRNÉO Curve duct can keep its circular aspect even at rest.</p> <p>- This product offers the advantage of using less space in some cases.</p>

Table 18: AIRNÉO Curve range



# V.

## Upkeep and maintenance service



**AÉRO TEXTILE CONCEPT**

3, rue de l'Industrie - 69530 Brignais  
Tél: (33) (0)4 78 05 35 54 - Fax: (33) (0)4 78 05 36 24  
info@aerotextile.com - www.aerotextile.com

Non-contractual document,  
the manufacturer reserves the right to  
modify specifications without prior notice

## 5.1 SERVICE PACKS

The important thing is to carry out cleaning of textile ducts and diffusers before dirt and / or clogging can be observed and thereby to ensure their hygiene, quality and maintain their efficiency.

Regular upkeep of your textile air diffusion units conditions the retention of your installations' aeraulics and climatic performance. This allows to:

- obtain savings
- increase your ducts' lifespan
- optimise the quality and hygiene of your manufactured products and of the blown air

We recommend washing and checking the ducts twice a year as a minimum, or more, depending on applications and environment in which hygiene and ease of cleaning are crucial.

ATC support you in the upkeep of all types of ducts, from any origins and thereby guarantee your aeraulics networks' performance, and offers you 3 service packs:

### 5.1.1 PREMIUM PACK

The PREMIUM PACK includes:

#### → CLEANING:

- diffusers of whatever brand and different types of textiles (polyester, polyamide, cotton, washable PVC ...)
- bespoke processes (disinfection, bleaching, washing...), without contact with ducts from other origins.

[No cleaning for textile in M0 fire resistance classification](#)

#### → TECHNICAL CONTROL:

- check of diffusers' general condition, inspection of seams, ties, snaps, slide fasteners, diffusing and watertight parts ...
- identification and assessment of signs of wear and tear

#### → REPAIRS:

- carrying out repairs
- writing an intervention report for each diffuser
- folding and packing in individual pouch with visible marking
- conditioning in carton packaging

### 5.1.2 EVOLUTION PACK

This pack is suitable for remodelling the installation. This service includes:

- cleaning, technical control and repairs for the diffusers (optional according to the ducts' condition on arrival)
- personalised study carried out in order to validate the modification's feasibility and guarantee the aeraulic result.
- modification of any brand of network. Any modification must be preceded by cleaning carried out by either your services or ours
- if ATC duct, update of original dossier in view of future replacement.

### 5.1.3 TEMPO PACK

This pack is recommended for process applications which operate on a continuous basis, without any down time. It also allows to carry out the renewal of existing aeraulics networks and includes 3 modules:

#### → TEMPO PACK: ATC spares kit

- rebuilding of the original network and taking into account the history of modifications carried out by ATC

#### → TEMPO PACK +: modified ATC spares kit

- regrouping the original dossier with the client's new data
- study of dossier in order to validate the aeraulics network's feasibility

#### → TEMPO EXPERT PACK: other makes' spares kit

- manufacturing based on technical information (drawings, flow, pressure...) or on a set of textile ducts from other makes, sent in advance to our workshops to carry out evaluation of ratings.
- study to guarantee the aeraulics result.

### 5.1.4 Bacteriological analysis

In relation with the SERVICE PACKS, ATC also offers as an option bacteriological controls with the objective of validating the textile ducts' cleaning and disinfection.

The bacteriological control service is based on counting cultivable micro-organisms (Colony-forming Unit, or CFU). Samples, taken before washing and after drying, allow to determine:

- number of mesophilic aerobic flora at 30°C.
- number of yeasts and moulds.

Textile elements that can be subject to such sampling are as follows:

- collars, cones, bottoms and moulding forms
- ducts' watertight parts
- ducts' diffusing parts

According to the results obtained, ATC will recommend an appropriate frequency for cleaning. As an indication, according to the **ASPEC (2004)** guide, surface microbiological thresholds in aerualics networks are:

- Threshold for triggering disinfection : 50 CFU/ 25 cm<sup>2</sup>
- Threshold for validation of disinfection : 10 CFU /25 cm<sup>2</sup>

Following your textile ducts' washing, ATC will send you a synthesis of bacteriological analyses results (see example below).

<b>Synthesis of Results Box on textile Surface</b>					
Client code : VC00019 Product designation: boxe on textile surface Report N° 03A296/2-02A operculum Commercial brand: CLAUGER					
Reference for contact boxes	Internal N°	Mesophilic aerobic flora (30°C)/25 cm <sup>2</sup>	Yeasts (25°C)/25 cm <sup>2</sup>	Moulds (25°C)/25 cm <sup>2</sup>	Date of sampling
AV 03A296/2-02A	857 - 2012- 0075790 857 - 2012- 0075791	> 100	< 1	9	16/10/2012
AP 03A296/2-02A	857 - 2012- 00075802 857 - 2012- 00075803	5	< 1	4	16/10/2012

Figure n° 30: Example of sampling results before and after cleaning, expressed in CFU

Each analysis result is compared to quality thresholds for microbiological criteria:

- between 0 and 2 CFU /25 cm<sup>2</sup> : Very good
- between 3 and 9 CFU /25 cm<sup>2</sup> : Good
- between 10 and 29 CFU /25 cm<sup>2</sup> : Doubtful (potential source of contamination)
- between 30 and 90 CFU /25 cm<sup>2</sup> : Bad (source of contamination)
- > 90 CFU /25 cm<sup>2</sup> : Very bad (proven source of contamination)

All bacteriological analyses are carried out by accredited laboratories which guarantee their results' reliability (non-contractual analysis reports)

## 5.2 UPKEEP INSTRUCTIONS FOR AIRNÉO RANGE

All textile ducts and diffusers in the AIRNÉO range are made to last. To that end, ATC have designed and developed a range of products with technical materials developed to keep their initial properties even after numerous cleans.

All AIRNÉO textile ducts and diffusers are entirely machine-washable (except AIRNÉO Gold textile ducts).

**WARNING:** NO PRODUCT IS COMPATIBLE WITH A HIGH PRESSURE AND/OR STEAM WASH

Table N° 19 indicates cleaning frequency to be applied in relation to general application type of the networks:

Type of premises	Filtration class	New air proportion	Number of annual washes
Cheese makers (maturing room)	EU 9	10 %	10 to 20
Cheese makers (storage room)	EU 9	10 %	5 to 10
Meat treatment	EU 9	10 %	4 to 8
Retaining ducts' whiteness			3 to 5
Offices (Air conditioning for comfort)	EU 7		1 to 4
Storage of packed products	EU 7		1 to 4
White room	EU 12 - 14		0 to 1

Table 19 : frequency of washes in relation to the type of application

This information is given as an indication. The frequency of cleaning can be reconsidered according to various factors with, among others, the amount of dust contained in the ambient air, the dust granulometry, the type of application, the type of textile used, the quality of upstream filtration ...

This table indicates cleaning frequencies for textile diffusers of RADIANT type.

For IMPULSION type of diffusers, the number of washes can be lessened. In fact, clogging in the latter being more difficult, the number of cleans can be reduced by 15 to 50%.

ENERGY type diffusers, due to their diffusion mode (perforations), are less prone to clogging and can therefore be the object of lower cleaning frequencies. Maintenance can prove necessary only in the framework of general premises hygiene.

ATC supply cleaning instructions indicating all of the procedures to be followed for each delivered duct or diffuser.

### 5.2.1 Cleaning symbols



Do not wash



Maximum temperature: **40°**  
 Mechanical action: **by hand**  
 Rinsing: **normal**  
 Spin drying: **precautions**



Maximum temperature: **40°**  
 Mechanical action: **normal**  
 Rinsing: **normal**  
 Spin drying: **normal**



Maximum temperature: **40°**  
 Mechanical action: **reduced**  
 Rinsing: in decreasing temperature  
 Spin drying: **reduced**



Do not chlorinate



Bleaching allowed with all types of products, particularly chlorine based (example: liquid bleach) or oxygen.



No ironing or steam



Ironing at a **maximum temperature of 110°** (steam treatment presents risks)



Do not dry-clean (action with stain removal)



Solvents or processes: **any solvents such as perchlorethylene, except for Trichlorethylene**  
 Process: **normal**  
 Self-service dry-cleaning: **permitted**



Solvents or processes: **exclusively oil-based** (mineral essences type)  
 Process: **normal**  
**Self-service dry-cleaning: not permitted**



Spin drying at **moderate temperature of 50° C** after wash



Spin drying not permitted

## 5.2.2 Maintenance instructions for Polyester textile ducts

### → Cleaning instructions

Reference LT / Reference CR / Reference CS / Reference ANTISTATIC  
Reference ANTIBACTERIAL / First / Curtain / Warm Up / ISOTEX (internal membrane)



#### Loading ratio:

This is the ratio between the quantity of washing (kg) that the machine can wash and the capacity of the latter's in litres. Note, this is not equivalent to the machine's capacity in weight; as a rule, the loading ratio is 1/18.

#### Soaking ratio:

This is the ration between the number of kg of material washed and the number of litres of water effectively contained in the machine.

- Average level: 1/5
- High level: 1/7

**Example:** for a machine with a theoretical capacity of 16 kg, operating with 80l of water in pre-wash and 60l in wash, you can wash 80/5 or 60/5 kg of material, ie. either 16 or 12 kg of material.

### → Washing method

#### Preparation of textiles

- Separate the following elements: duct, diffusion cone, collar and bottom
- Regroup the elements according to the machine's capacity
- Turn the textile ducts inside out (inside out cleaning) remove the dirt which is at the bottom of the duct
- Turn the ducts back to normal position

### → Washing

Operation	Product	g/kg material	Duration	Temperature	Soaking ratio
Wetting	TREBON 2	2 to 5	5'	cold	1/7
Pre-wash	TREBON PLUS	10 to 20*	10'	40°C	1/5
Washing 1	TREBON PLUS	10 to 20*	15'	40/60°C**	1/5
Washing 2	OTTALIN OXY	5 to 10	15'	40/60°C**	1/5
Rinse1			3'	cold	1/7
Rinse 2			3'	cold	1/7
Rinse 3			3'	cold	1/7

\* 10 g/kg if the water is reasonably soft, 20 g/kg if the water is hard.

\*\* 40°C for frequent washes, if not **60°C maximum**

In cases of heavy soiling and for grey-ish ducts, add Ottalin Oxy (bleaching agent with active oxygen).

→ Drying

- Gentle spin-drying can be carried out at the end of the rinse cycle.
- Preferably drying in open air or in industrial dryer, but only if dryer is equipped with a thermostat allowing to limit blown air temperature to 45°C maximum.
- Time in an industrial dryer should be 20 minutes maximum. Check on the ducts' state every 5 minutes in order to avoid any overheating of the product.
- Never store wet ducts (risk of mould developing).



Absolutely no ironing.

**Note:** White textile polyester ducts have a natural tendency to turn grey. The washing machine's mechanical and chemical action does not always allow them to recover their original colour.

This in no way alters the duct's diffusing function.

Indeed, dust gets ingrained into the textile fibre and cannot be removed solely through the washing machine's action. You can add a bleaching agent if you wish to have an extra treatment (see previous page).

Some colours can alter over time. Only regular cleaning of the duct will allow the colour to endure over time.

The products mentioned above are KREUSSLER products. A distributors' list can be obtained from:

KREUSSLER

[www.kreussler-chemie.de](http://www.kreussler-chemie.de)

It is possible to use products from other makes, of compatible types and with appropriate and tested dosage.

**Precautions:**

- Do not mix washing products before placing in the machine.
- Do not place whitening agent « OTTALIN OXY » directly on textiles.
- Privilege ducts cleaning by competent professionals.



**WARNING** – Any exceeding of the indicated temperatures and/or dosages would bring about an irreversible destruction of the products and cancellation of their guarantee.  
– NO ATC PRODUCT IS COMPATIBLE WITH HIGH PRESSURE OR STEAM WASH

### 5.2.3 Maintenance instructions for AIRNÉO Classic textile ducts

#### → Cleaning instructions



#### → Washing method

##### Preparation of textiles:

- Separate the following elements: duct, diffusion cone, collar and bottom
- Regroup the elements according to the machine's capacity
- Turn the textile ducts inside out (inside out cleaning) remove the dirt which is at the bottom of the duct
- Turn the ducts back to normal position

#### → Washing

Operation	Product	g/kg material	Duration	Temperature	Soaking ratio
Wetting	TREBON 2	2 to 5	5'	cold	1/7
Pre-wash	TREBON PLUS	10 to 20*	10'	40°C	1/5
Washing 1	TREBON PLUS	10 to à 20*	15'	40	1/5
Washing 2	OTTALIN OXY	5 to 10	15'	40	1/5
Rinse1			3'	cold	1/7
Rinse 2			3'	cold	1/7

\* 10 g/kg if the water is reasonably soft, 20 g/kg if the water is hard.

#### → Drying

- Gentle spin-drying can be carried out at the end of the rinse cycle.
- Drying only in open air
- Never store wet ducts (risk of mould developing).



Absolutely no ironing

Above mentioned products are KREUSSLER products. A distributors' list can be obtained from:

KREUSSLER

[www.kreussler-chemie.de](http://www.kreussler-chemie.de)

It is possible to use products from other makes, of compatible types and with appropriate and tested dosage.

**Precautions:**

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- Do not place whitening agent « OTTALIN OXY » directly on textiles.
- Privilege ducts cleaning by competent professionals.



**WARNING** – Any exceeding of the indicated temperatures and/or dosages would bring about an irreversible destruction of the products and cancellation of their guarantee.  
– NO ATC PRODUCT IS COMPATIBLE WITH HIGH PRESSURE OR STEAM WASH

### 5.2.4 Maintenance instructions for AIRNÉO Gold textile ducts

#### → Cleaning instructions



 No cleaning in machine

M0 textile ducts are not machine-washed.  
Their upkeep is reduced thanks to their dirt-proof internal and external coating.

Be careful never to step on the diffuser or to fold it too brutally.  
Glass, the principal component, can break if folded at an acute angle.

#### Cleaning of diffusing area

If diffusion is of energy type (orifices) only the rim of diffusion is dirty, see external cleaning.

#### External cleaning

It is carried out with a wet sponge.  
Use of an ordinary detergent (of washing-up liquid type) is possible.

#### Internal cleaning

It is carried out in the same way as external cleaning but, beforehand, turn the diffuser over.  
If it is very dirty, a gentle jet wash can be carried out (DO NOT USE HIGH PRESSURE OR STEAM CLEANERS).  
When being cleaned, the diffuser must be placed on a smooth and clean surface in order to avoid dirtying it.

We recommend manual cleaning once every 2 to 3 years, according to the type of application and filtration class chosen upstream.  
To limit Fireguard M0 textile ducts getting dirty, we advise type F7 filtration.

 **WARNING** – Disregarding maintenance procedures recommended by ATC brings about cancellation of the guarantee.

# 5.3 REQUEST FOR "AIRNÉO PLUS" SERVICE PRICE

	Company: ATC (AERO TEXTILE CONCEPT) Contact for Service : Mrs. Cécile PILLLOT Tel: 00 33 (0)4 78 05 35 54 Email : cpillot@aerotextile.com																									
3, rue de l'industrie - 69530 Brignais - France Tel : (+33) 04 78 05 35 54 - Fax : (+33) 04 78 05 36 24 www.aerotextile.com	<b>PRICE REQUEST SERVICE AIRNEO + TEMPO PACK</b>																									
Date of enquiry:	Project reference:																									
<b>YOUR CONTACT INFORMATION</b>																										
Corporate name:																										
Requester's name:																										
Email address:																										
Phone:																										
Company address:																										
<b>SERVICES TO BE PROVIDED (Possible multiple choices)</b>																										
PACK TEMPO - ATC spares kit PACK TEMPO + - ATC modified spares kit PACK TEMPO EXPERT - Other makes' spares kit																										
<b>TEMPO PACK - ATC SPARES KIT</b>																										
Reference of the original duct (to be found at 12 O'clock, beginning of the duct)  ex: 02A320-01A / 103325-01B																										
<b>PACK TEMPO + - MODIFIED ATC SPARES KIT</b>																										
Reference of the original duct (to be found at 12 O'clock, beginning of the duct)  ex: 02A320-01A 103325-01B	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 15%;">Textile</td> <td style="width: 15%;">Colour</td> <td style="width: 15%;">Shape</td> <td style="width: 15%;">Diffusion</td> </tr> <tr> <td></td> <td>Textile</td> <td>Colour</td> <td>Shape</td> <td>Diffusion</td> </tr> </table>		Textile	Colour	Shape	Diffusion		Textile	Colour	Shape	Diffusion		Textile	Colour	Shape	Diffusion		Textile	Colour	Shape	Diffusion		Textile	Colour	Shape	Diffusion
	Textile	Colour	Shape	Diffusion																						
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	Textile	Colour	Shape	Diffusion																						
	Textile	Colour	Shape	Diffusion																						
	Textile	Colour	Shape	Diffusion																						
<b>PACK TEMPO EXPERT - OTHER MAKES' SPARES KIT</b>																										
We are able to realise spares kit of non ATC ducts with the following data: * Measurements of original network (if possible, indicate operating point) * By filling in our price request form																										
Additional request:  Documentation <input type="checkbox"/> <span style="margin-left: 200px;">Wish to be contacted by <b>AIRNÉOPLUS</b> Department</span> <input type="checkbox"/>																										



	Company: ATC (AERO TEXTILE CONCEPT) Contact for Service : Mrs. Cécile PILLOT Tél: 00 33 (0)4 78 05 35 54 Email : cpillot@aerotextile.com					
3, rue de l'industrie - 69530 Brignais - France Tel : (+33) 04 78 05 35 54 - Fax : (+33) 04 78 05 36 24 www.aerotextile.com	<b>PRICE REQUEST / SERVICE AIRNEO +                  PREMIUM PACK                  EVOLUTION PACK</b>					
Date of enquiry:	Project reference:					
<b>YOUR CONTACT INFORMATION</b>						
Corporate name:						
Requester's name:						
Email address:						
Phone:						
Company address:						
<b>TEXTILE DUCTS' RANGE OF USE</b>						
Food-Processing	Special Events	Hygiene (laboratories)	Industry	Logistics	Tertiary Activities	Public Buildings
<b>CLEANING FREQUENCY</b>						
1 to 3 washing(s) / ye <input type="checkbox"/>		4 to 12 washings / year <input type="checkbox"/>		over 12 washings / year (to be specified) .....		
<b>SERVICE TO BE PROVIDED</b>						
<b>PACK PREMIUM</b>						
Cleaning			Washing Control Repairs			
OPTION: Bacteriological analysis						
<b>PACK EVOLUTION</b>						
Washing Control Repairs OPTION: Bacteriological analysis  Modifications						
<b>DUCTS CHARACTERISTICS</b>						
Ø of the ducts	Duct length (in linear meter) Polyester / Polyamide / Coton ...	Duct length (in linear meter) PVC / Polyurethane	Duct length (in linear meter) Coated glass fabric - Range M0*			
Ø < 900 mm						
Ø > 900 mm						
<small>AIRNEO textile ducts are entirely washable in machine (except AIRNEO GOLD textile ducts or M0 range glass fiber fabric)</small>						
<b>SPECIFICITIES TO BE ANTICIPATED REGARDING DUCTS MODIFICATIONS</b>						
Origin of the duct to be modified			Modifications to be done			
DUCTOF ATC ORIGINE Reference:	NON ATC DUCT Reference:					
DUCTOF ATC ORIGINE Reference:	NON ATC DUCT Reference:					
DUCTOF ATC ORIGINE Reference:	NON ATC DUCT Reference:					
DUCTOF ATC ORIGINE Reference:	NON ATC DUCT Reference:					
DUCTOF ATC ORIGINE Reference:	NON ATC DUCT Reference:					
Additional request:						
Documentation <input type="checkbox"/>		Wish to be contacted by AIRNÉOPLUS Department <input type="checkbox"/>				





# VI.

## Study and quotations



**AÉRO TEXTILE CONCEPT**

3, rue de l'Industrie - 69530 Brignais  
Tél: (33) (0)4 78 05 35 54 - Fax: (33) (0)4 78 05 36 24  
info@aerotextile.com - www.aerotextile.com

Non-contractual document,  
the manufacturer reserves the right to  
modify specifications without prior notice

**ATC** carries out study and calculations for your textile networks. Each project presents characteristics (section, support, type of diffusion, materials...) linked to your constraints (space available, obstacles, speed or air constraints ...).

In order to give you an accurate and coherent answer that meets your expectations, we need a certain number of technical data.

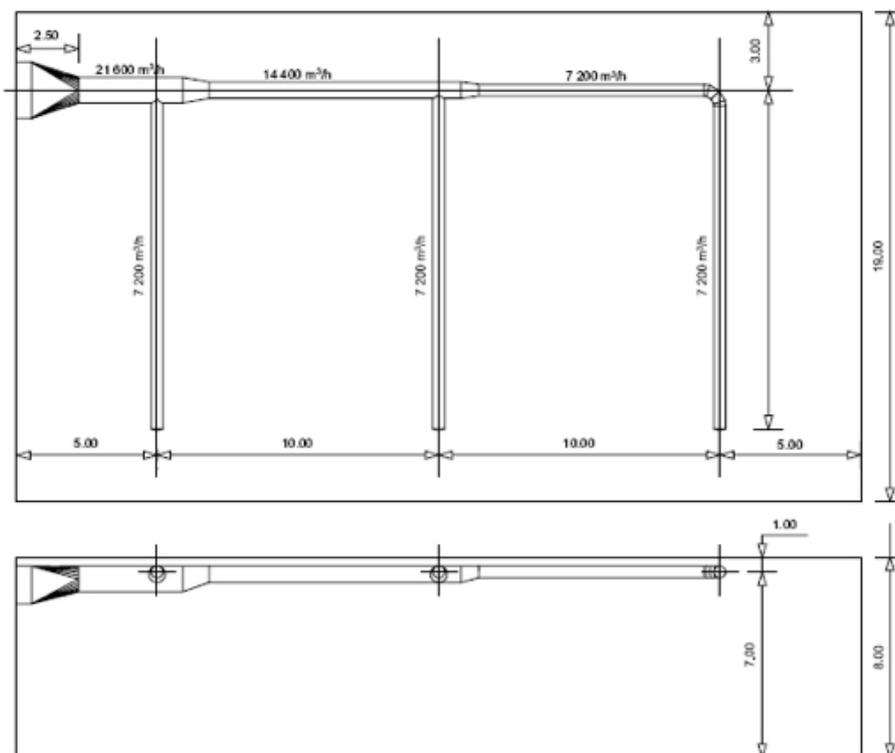
We have created for you an information form regrouping all of the important parameters. This form will, in the event of complex networks

need to be accompanied with diagrams or drawings including the following elements:

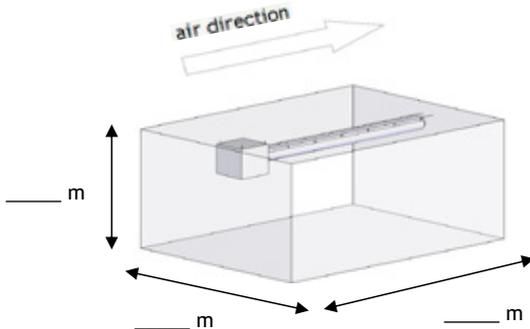
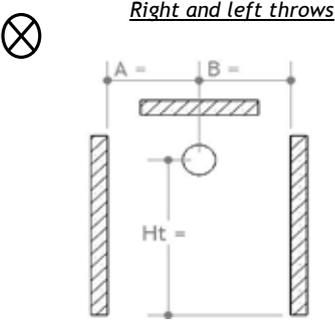
- network's geometry (isometric view or view from above and cross-section view)
- distribution of flows carried and diffused per antenna
- types of sections envisaged (circular, semi-circular, quarter circle...)
- complete implantation rating for the network (distance from premises edge to axis, centre to centre distance for ducts ...).

An isometric cross-ruled sheet is available for the mapping-out of networks. (page VI.4 ISO SKETCHES)

*Example:*

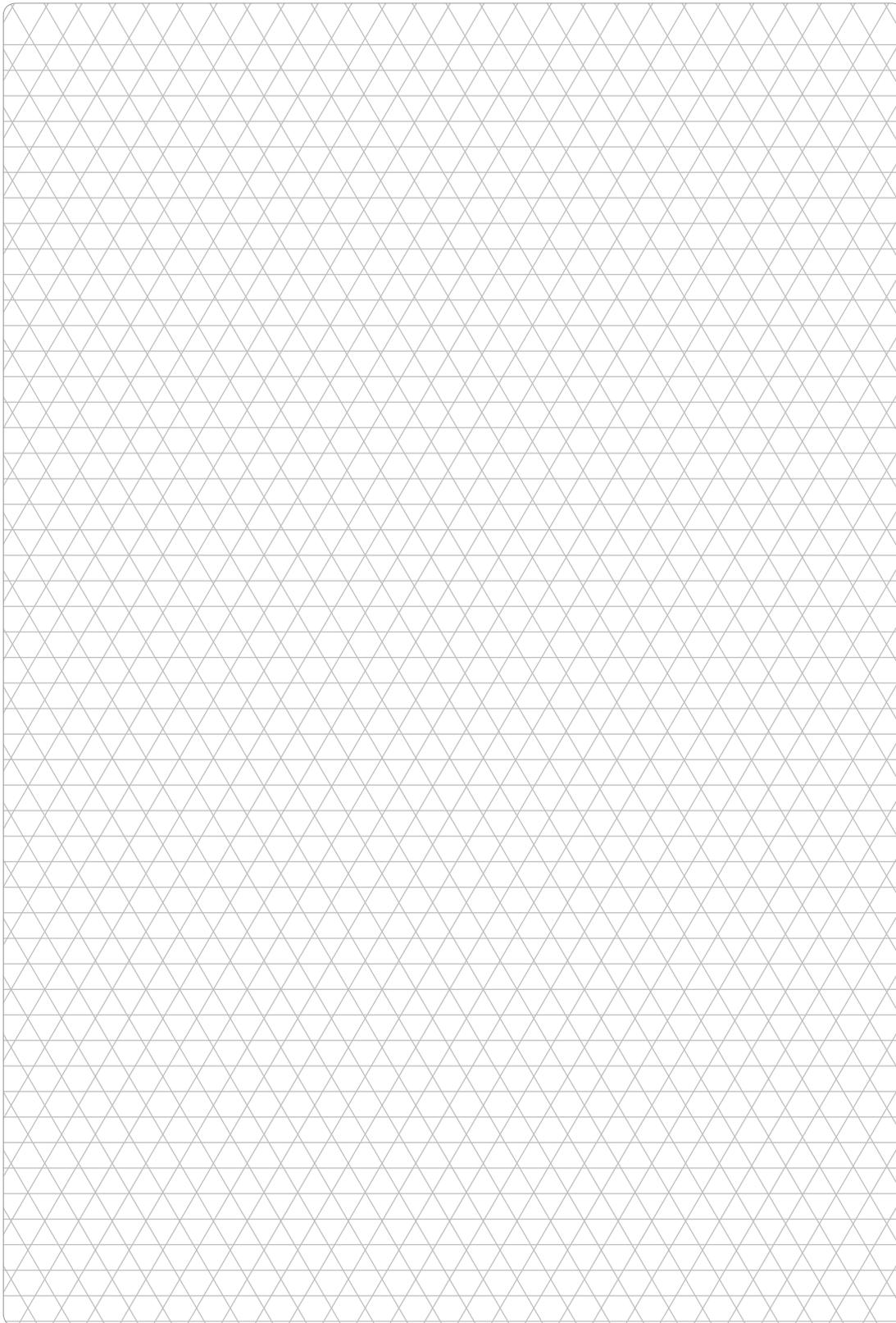


# 6.1 REQUEST FOR QUOTATION

	Company : ATC Contact : Tel : Email :	Company : Contact : Tel : Email :										
3 rue de l'industrie 69530 Brignais - France Tel : (+33) 04 78 05 35 54 Fax : (+33) 04 78 05 36 24 Web : www.aerotextileconcept.com	PRICE REQUEST	Date :										
	Construction site ref : Date of installation : <input type="checkbox"/> PROJECT <input type="checkbox"/> Execution											
<b>Application :</b> <table style="width:100%; border: none;"> <tr> <td style="width:33%;"><input type="checkbox"/> Food-processing industry</td> <td style="width:33%;"><input type="checkbox"/> Public area</td> </tr> <tr> <td><input type="checkbox"/> Clean room, laboratory</td> <td><input type="checkbox"/> Industry</td> </tr> <tr> <td><input type="checkbox"/> Logistic / storage</td> <td><input type="checkbox"/> Service (office...)</td> </tr> </table> Site description / process details :			<input type="checkbox"/> Food-processing industry	<input type="checkbox"/> Public area	<input type="checkbox"/> Clean room, laboratory	<input type="checkbox"/> Industry	<input type="checkbox"/> Logistic / storage	<input type="checkbox"/> Service (office...)				
<input type="checkbox"/> Food-processing industry	<input type="checkbox"/> Public area											
<input type="checkbox"/> Clean room, laboratory	<input type="checkbox"/> Industry											
<input type="checkbox"/> Logistic / storage	<input type="checkbox"/> Service (office...)											
<b>Thermal action :</b> <table style="width:100%; border: none;"> <tr> <td style="width:33%;"><input type="checkbox"/> Reversible</td> <td style="width:33%;"><input type="checkbox"/> Heating</td> </tr> <tr> <td><input type="checkbox"/> Cooling</td> <td><input type="checkbox"/> Refrigeration</td> </tr> <tr> <td><input type="checkbox"/> Ventilation</td> <td><input type="checkbox"/> Air transport</td> </tr> </table> Air treatment application ( <i>general treatment, zoning on process...</i> ) : _____ Specific restrictions (public area, process...) : _____			<input type="checkbox"/> Reversible	<input type="checkbox"/> Heating	<input type="checkbox"/> Cooling	<input type="checkbox"/> Refrigeration	<input type="checkbox"/> Ventilation	<input type="checkbox"/> Air transport				
<input type="checkbox"/> Reversible	<input type="checkbox"/> Heating											
<input type="checkbox"/> Cooling	<input type="checkbox"/> Refrigeration											
<input type="checkbox"/> Ventilation	<input type="checkbox"/> Air transport											
<b>Site :</b> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>_____ m _____ m _____ m</p> </div> <div style="text-align: center;">  <p><i>Right and left throws</i></p> </div> </div> <p style="text-align: center; font-weight: bold;">For more sophisticated textile ducts network, thanks to forward us technical drawings (DWG or PDF)</p>												
<b>Aeraulic and thermal data :</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">Volume air flow = m3/h</td> <td style="width:50%;">Blowing temperature in summer = °C</td> </tr> <tr> <td>Static pressure (entry of fabric duct) = Pa</td> <td>Ambient temperature in summer = °C</td> </tr> <tr> <td>Extraction position : <input type="checkbox"/> High <input type="checkbox"/> Low <input type="checkbox"/> Messy</td> <td>Blowing temperature in winter = °C</td> </tr> <tr> <td></td> <td>Ambient temperature in winter = °C</td> </tr> <tr> <td></td> <td>Filtration (G4, F7...) :</td> </tr> </table>			Volume air flow = m3/h	Blowing temperature in summer = °C	Static pressure (entry of fabric duct) = Pa	Ambient temperature in summer = °C	Extraction position : <input type="checkbox"/> High <input type="checkbox"/> Low <input type="checkbox"/> Messy	Blowing temperature in winter = °C		Ambient temperature in winter = °C		Filtration (G4, F7...) :
Volume air flow = m3/h	Blowing temperature in summer = °C											
Static pressure (entry of fabric duct) = Pa	Ambient temperature in summer = °C											
Extraction position : <input type="checkbox"/> High <input type="checkbox"/> Low <input type="checkbox"/> Messy	Blowing temperature in winter = °C											
	Ambient temperature in winter = °C											
	Filtration (G4, F7...) :											
<b>Fabric ducts characteristics :</b> <table style="width:100%; border: none;"> <tr> <td style="width:50%; vertical-align: top;">                 This information will help us to define the appropriate material to your application   <div style="border: 1px solid black; width: 150px; height: 30px; margin-left: 20px;"></div>                 Signature / Customer stamp             </td> <td style="width:50%; border: none;">                 Shape : <input type="checkbox"/> Ø <input type="checkbox"/> 1/2 Ø <input type="checkbox"/> 1/4 Ø                  Length of the duct : m                  Fire classification : <input type="checkbox"/> M1 <input type="checkbox"/> M0 <input type="checkbox"/> Other :                  Supply position : <input type="checkbox"/> by the extremity                                            <input type="checkbox"/> by the top and the extremity                                            <input type="checkbox"/> by the top and the middle                  Colour : <input type="checkbox"/> White <input type="checkbox"/> Grey                            <input type="checkbox"/> Other : <input type="checkbox"/> Screen printing  <input type="checkbox"/> Hanging <input type="checkbox"/> Cable(s) <input type="checkbox"/> PVC rail <input type="checkbox"/> ALU rail             </td> </tr> </table>			This information will help us to define the appropriate material to your application  <div style="border: 1px solid black; width: 150px; height: 30px; margin-left: 20px;"></div> Signature / Customer stamp	Shape : <input type="checkbox"/> Ø <input type="checkbox"/> 1/2 Ø <input type="checkbox"/> 1/4 Ø Length of the duct : m Fire classification : <input type="checkbox"/> M1 <input type="checkbox"/> M0 <input type="checkbox"/> Other : Supply position : <input type="checkbox"/> by the extremity <input type="checkbox"/> by the top and the extremity <input type="checkbox"/> by the top and the middle Colour : <input type="checkbox"/> White <input type="checkbox"/> Grey <input type="checkbox"/> Other : <input type="checkbox"/> Screen printing <input type="checkbox"/> Hanging <input type="checkbox"/> Cable(s) <input type="checkbox"/> PVC rail <input type="checkbox"/> ALU rail								
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## 6.2 ISO SKETCHES



Date



Project Reference  
Additional Information:





# VII.

## Lexicon



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### Octave bands and Overall Level

Sensation to the ear according to frequency is not linear. Frequency values are normalised to express this sensation:  
31,5 / 63 / 125 / 250 / 500 / 1000 / 2000 / 4000 / 8000

Overall level corresponds to the weighted sum of all octave bands.

### CFD "Computational Fluid Dynamics"

CFD is a set of digital methods that allow to reach an approximate solution to a problem of fluid dynamics and/or of thermal transfer. Fluid mechanics are governed by equations with partial derivatives (Navier-Stokes) coupled and non-linear, the resolution of which is difficult through analysis. Through discretization methods (finite elements), digital resolution of equations is then obtained at each knot until calculations converge.

### Deflection

This is the vertical distance between the height of the air jet's exit point and a point on the jet's axis for a given speed. Generally, a residual speed of 0.2 to 0.5 m/s is assumed, depending on the desired comfort level in the occupied area. An anisothermal jet blown horizontally is subject to an upward deflection if it is warmer than ambient air or downward if it is cooler.

### Diffusion

A phenomenon in which the different fluids in contact with each other mix in such a way as to reach a uniform state. A phenomenon of air distribution in a given space, through blowing outlets or diffusing bands, oriented according to need.

### Diffuser

Element the purpose of which is distributing a fluid in a given flow according to established criteria.

### Light irradiance

Quotient of luminous flux by a surface

### Luminous flux

Quantity of light emitted by one source (unit: Lumen [lm])

### NR Index (Noise Rating ration), or ISO

It is a mode of characterisation for a standard acoustic comfort defined for each octave band.

## Induction

A phenomenon which allows to set in motion a flow of air n times greater than its own flow, through blowing in a reduced air flow.

## Lux

Unit of measurement for light irradiance

## Lumen

Unit of measurement for luminous flux

## Dynamic pressure

It is the fluid's kinetic energy. It is therefore directly linked to its flow velocity. It is expressed as follows:

$$P_{\text{dyn}} = 1/2 \cdot \rho \cdot v^2$$

with:

$\rho$  [kg/m<sup>3</sup>] air density

$v$  [m/s] flow velocity

$P_{\text{dyn}}$  [Pa] dynamic pressure

## Static pressure

It is the pressure inside a fluid (at rest or in motion). In practice, when the static pressure of a fluid in motion is measured, this measurement is carried out perpendicular to speed.

## Range

Horizontal distance covered by an air jet ejected from a diffuser. This distance is measured from the diffuser to the point where the jet reaches terminal speed. This speed, called « residual speed », depends on the air treatment objective.

## Acoustic power $L_w$ et acoustic pressure $L_p$

A sound source radiates acoustic energy that is its acoustic power. That source generates an acoustic pressure field according to its power and to the reverberation characteristics of the environment in which it is situated.

## Resurgence in static pressure

Transformation of dynamic pressure into static pressure in the diffusing duct allowing homogeneous diffusion.



# Recognised know-how, both in France and internationally Acclaimed by decision makers

- ▶ consultants in thermals and fluids
- ▶ refrigeration and air conditioning installers
- ▶ manufacturers for air treatment machines
- ▶ general contractors
- ▶ architects
- ▶ users



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code with your  
smartphone

Contact us:



#### Headquarters

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