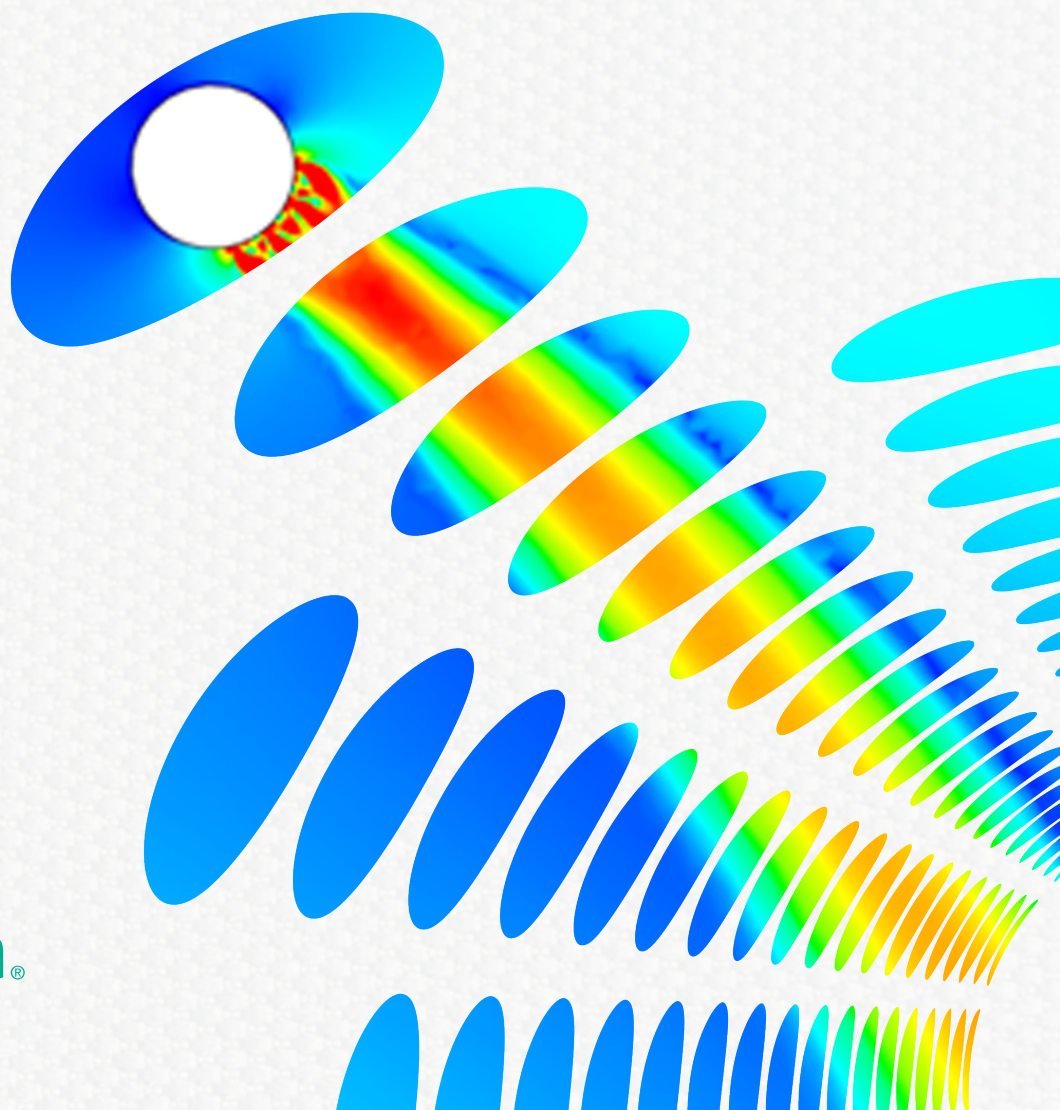


FABRIC DUCTING&DIFFUSERS

Technical data

English version



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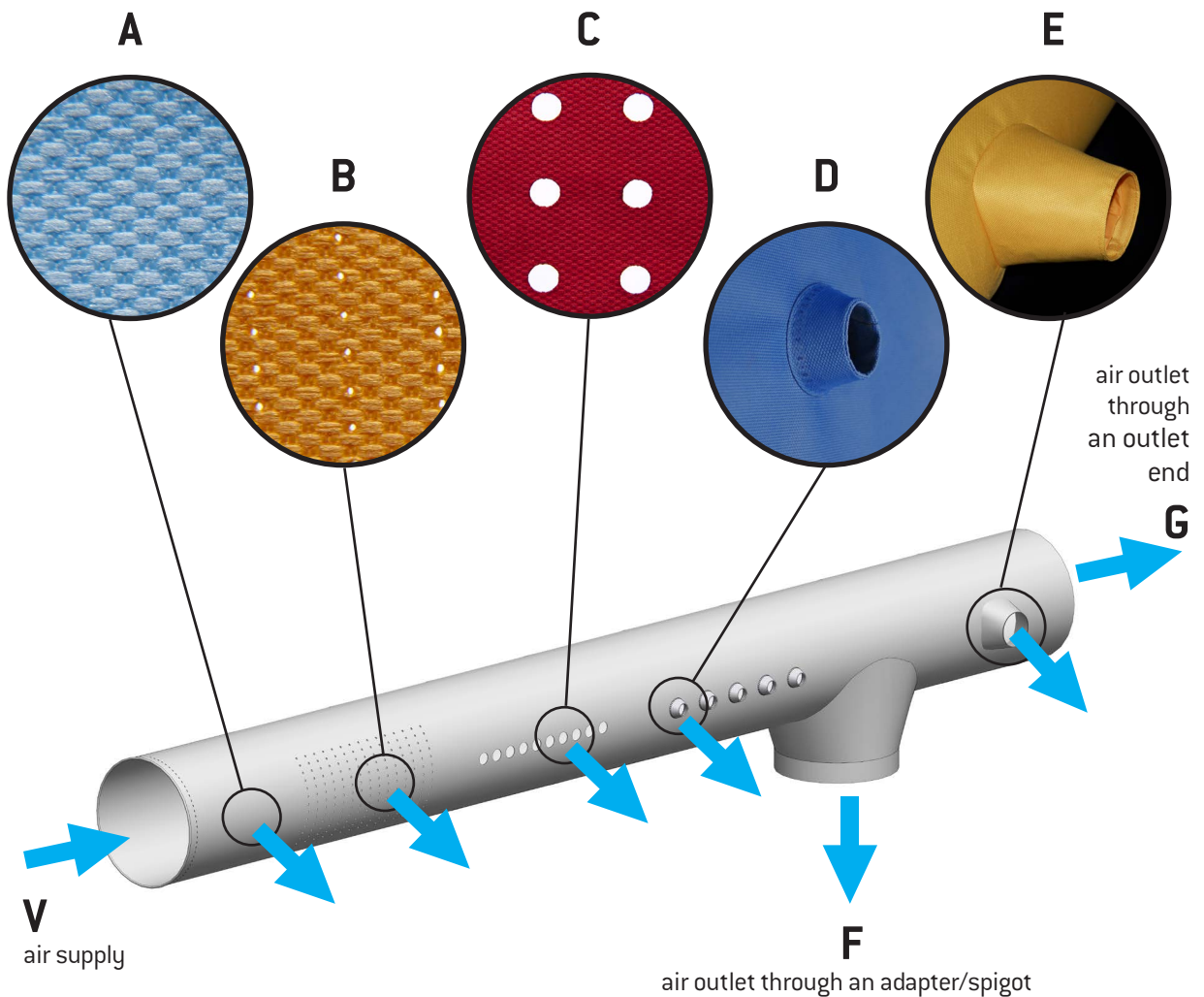
1. Operation of Fabric Ducting & Diffuser

Prihoda products are usually acting as both supply air ducting (air transfer) as well as air distribution/diffusion into the occupied zone. We supply both types of system, (1) positive pressure distribution systems (supply air) and (2) negative pressure (extract /return air) ducting for exhausting air from rooms.

1.1. Air Outlet from a Diffuser

Supply air [see V below] flowing into the diffuser through either end or an inlet spigot, can exit the diffuser in any of the following methods:

- A - through the permeable fabric material
- B - through microperforations – 200 – 400 μm laser cut holes in the fabric
- C - through perforations – laser cut holes with a diameter greater than 4 mm
- D - through small fabric nozzles
- E - through big fabric nozzles
- F - through an adapter/outlet spigot – air is diverted to another system/area
- G - through an outlet end – air leads to another system/area



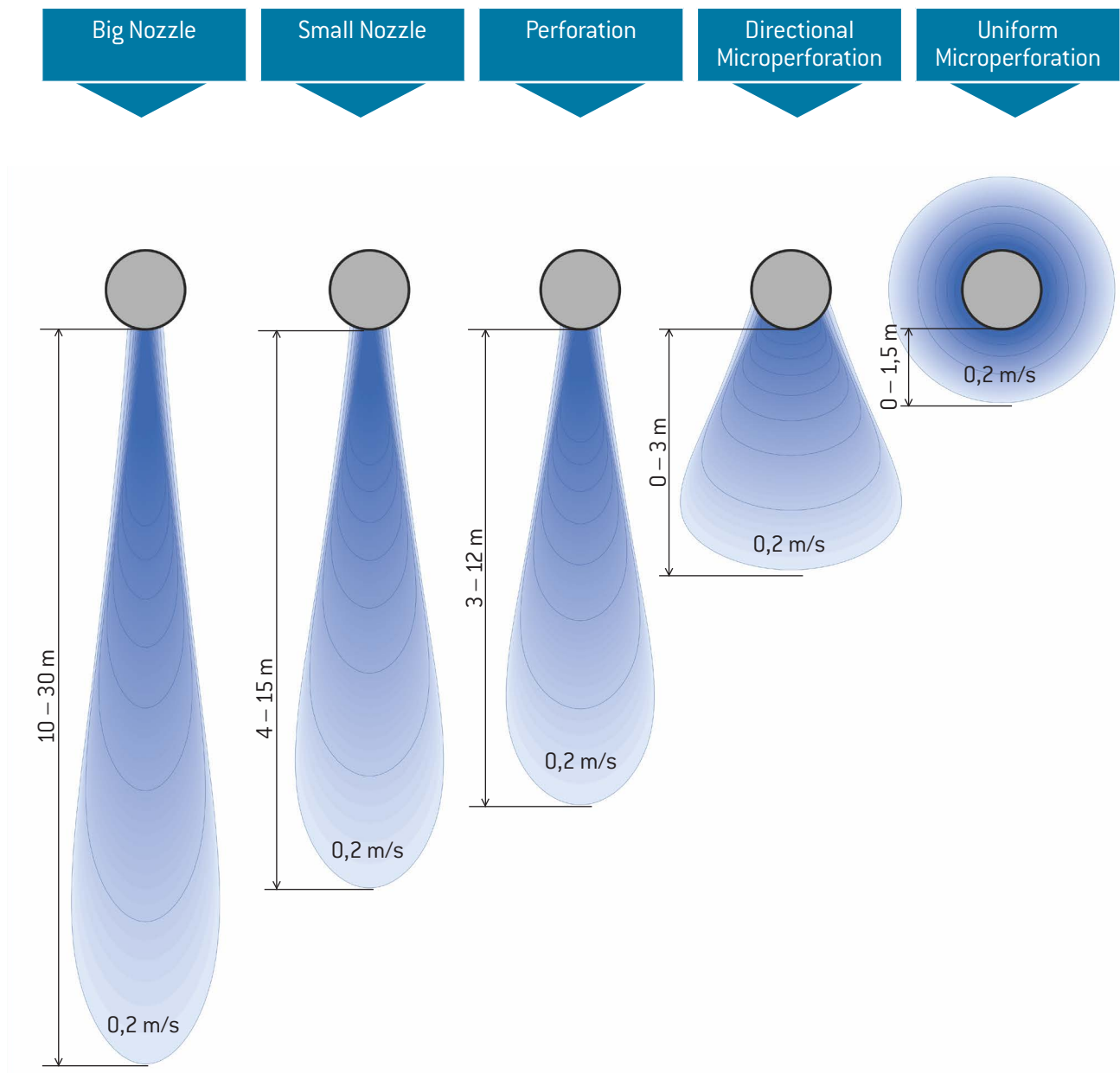
It always holds true that: $V = A + B + C + D + E + F + G$

(certain values of A, B, C, D, E, F, G may be zero)

Supply air is delivered through fabric diffusers using almost any diameter of laser cut perforation in any position on the duct circumference. This combination of any size and position of perforations provides an almost infinite number of design variations. The range of possibilities begins with low velocity diffusion and continues up to long-distance targeted air supply. Small perforations with a diameter of 200 - 400 μm , which we refer to as microperforations, are designed mainly for use as low velocity air diffusion. We use a series of 4 mm diameter or larger holes, which we call perforations, to provide directed air supply. When calculating the air travel distance, the supply air to room temperature difference must be considered.

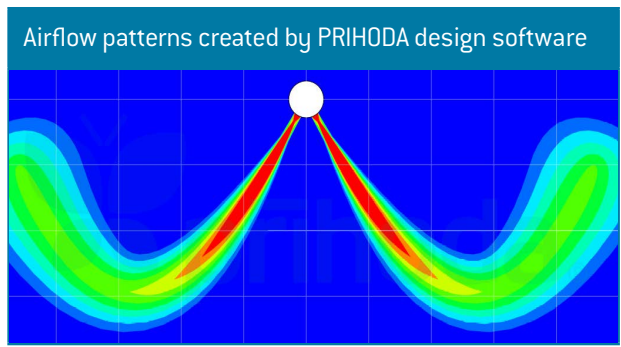
Fabric Diffusers are a universal air distribution tool and cover the entire range of air delivery patterns. We achieve the requested air distribution by selecting the correct air outlet method. We can combine the air outlet methods on a single diffuser duct in any pattern or ratio we wish.

Airflow Travel Distance from Fabric Diffusers

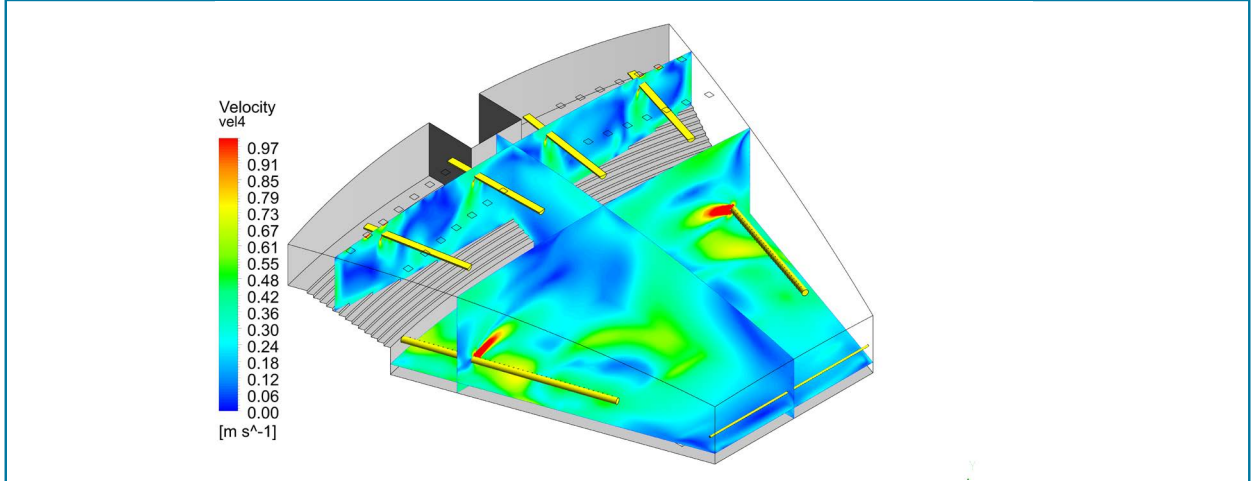


Travel distance varies depending upon available static pressure and temperature difference.

The air velocity at various distances from the diffuser can be calculated by our 'in house' design software which is being constantly refined and takes into account all associated design influences. These include specifically, positive pressure in the diffuser, position and dimensions of outlet openings, and temperature difference. In cases where the air velocity cannot be reliably calculated by the software (due to complex interaction of multiple airflows for example) we can provide these calculations by means of our Fluent software.

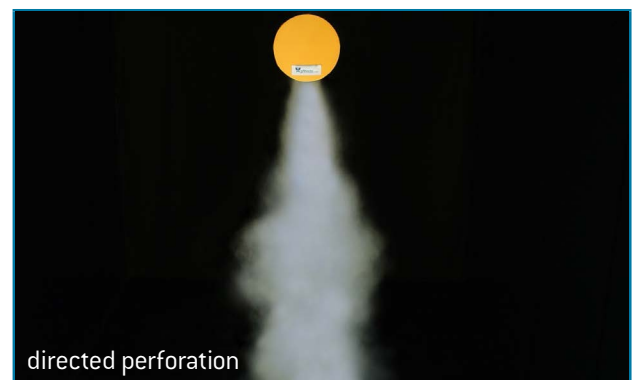
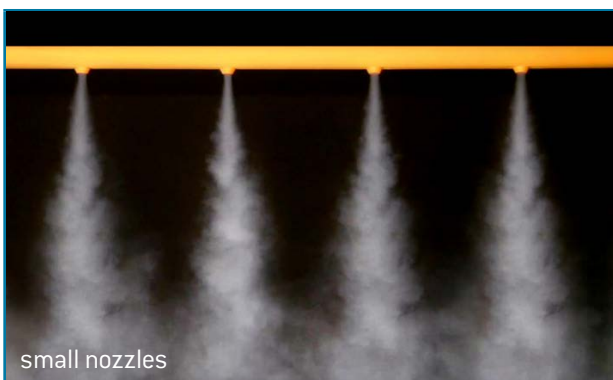


Airflow pattern created by Prihoda using Fluent Software



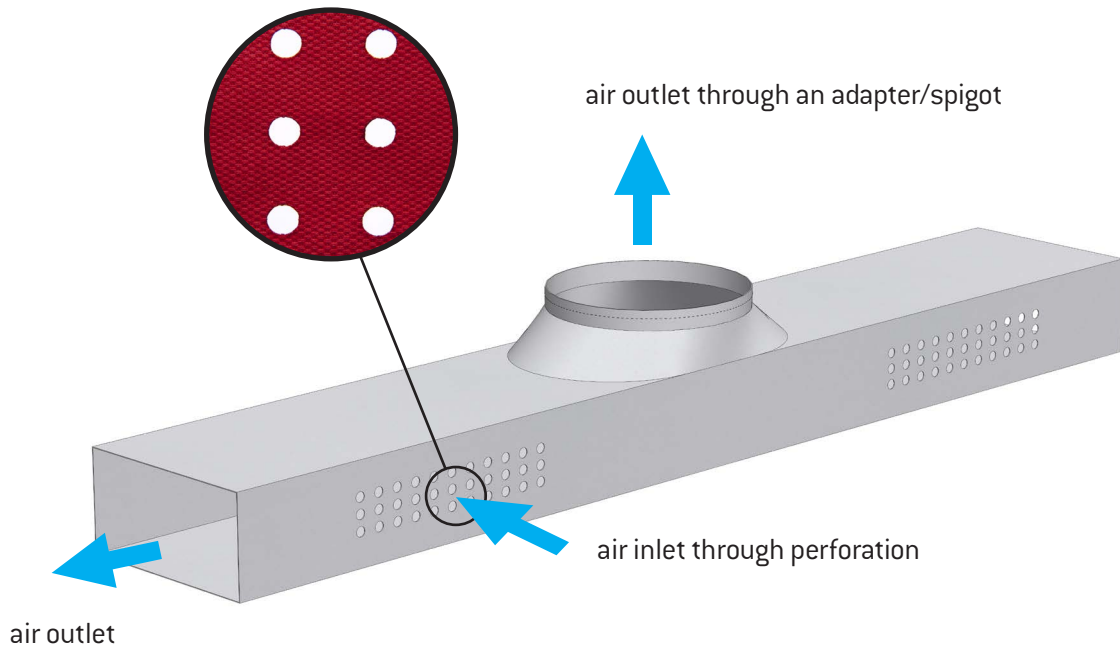
In general, Prihoda Fabric Diffusers operate at similar air flow velocities to traditional ducting. The maximum speed within the duct is dictated by aerodynamic noise in relation to the place of use. A further velocity limitation may be needed due to flow turbulence, which can cause vibration of the fabric. Specific conditions of flow, static pressure and weight of the fabric used must be taken into account.

Examples of airflow patterns created using smoke tests in the PRIHODA R&D centre



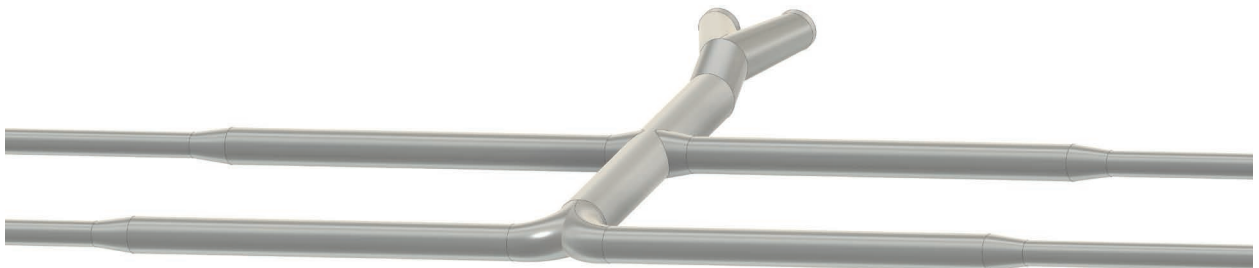
1.2. Air Entry into Negative Pressure (extract) Ducting

Perforations are used to allow extract air into negative pressure ducting.



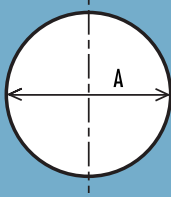
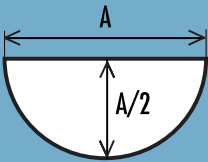
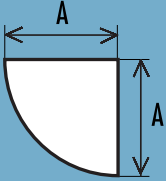
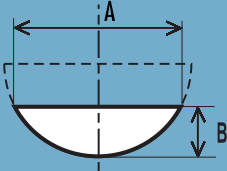
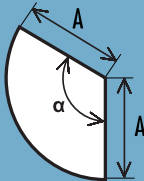
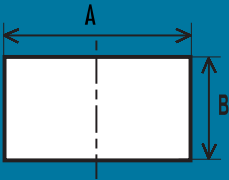
1.3. Air Transfer Ducting

Ducting made from impermeable fabric or insulated ducting transports air to the destination WITHOUT diffusion. We have the technical ability to design and manufacture, branches, bends and other fittings for any situation.



2. Primary Characteristics of Prihoda Products

2.1. Cross Section

| | | | | |
|-------------------------------|----|---------------|---|--|
| POSITIVE PRESSURE ONLY | C | CIRCULAR |  | The standard shape, easy maintenance, preferentially recommended. |
| | H | HALF-ROUND |  | For use where there is not enough space for circular diffuser and aesthetic applications. |
| | Q | QUARTER-ROUND |  | For use where there is not enough space for circular diffuser, in aesthetic applications and if the diffuser is to be installed in the corner of a room. |
| | SG | SEGMENT |  | For use where there is not enough height for a half-round diffuser. |
| | SC | SECTOR |  | Available if the room corner construction requires a different shape to quarter round. |
| POSITIVE OR NEGATIVE PRESSURE | S | SQUARE |  | The shape of the S cross-section becomes partially deformed due to positive or negative pressure and to material flexibility despite of a good stretch. |

We also make fabric transitions to adapt and join different shapes together.

In the case of Square ducts the shape partially deforms upon duct inflation, due to positive pressure or negative pressure and the flexibility of the material.

2.2. Dimension

We manufacture fabric ducting and diffusers of all dimensions from 100 mm to 2000 mm, each designed to specific requirements. The duct inlets and connection spigots are always manufactured 10–15 mm larger than the specified size / diameter for ease of connection.

Standard manufacturing dimensions (other sizes are available):

100, 125, 160, 200, 250, 315, 400, 500, 630, 710, 800, 900, 1 000, 1 120, 1 250, 1 400, 1 600, 1 800, 2 000

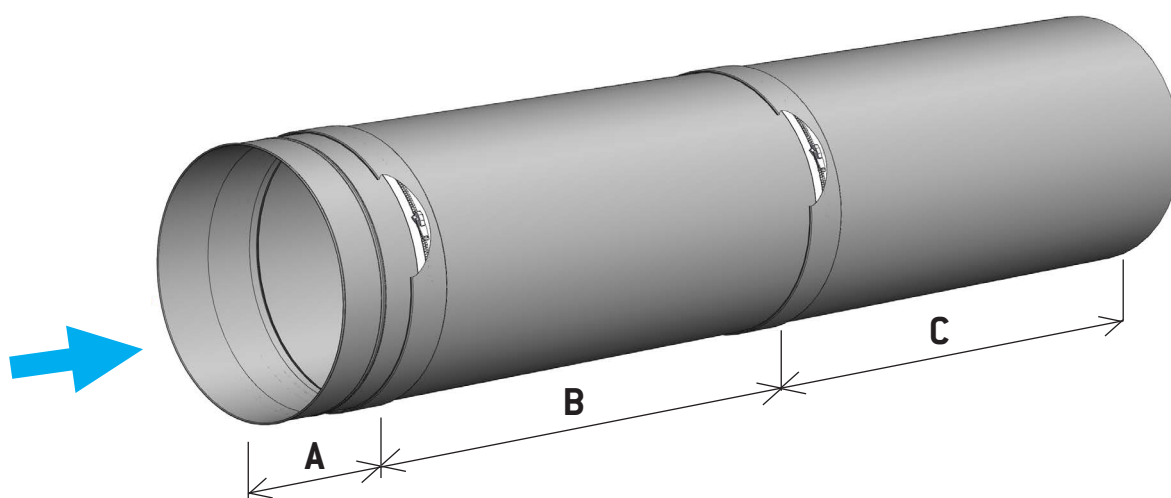
| Shape | Dimension (values A,B) |
|---------------|------------------------|
| circular | diameter (A) |
| half-round | diameter (A) |
| quarter-round | radius (A) |
| segment | width, height (A,B) |
| sector | radius (A) |
| square | length of edges (A,B) |

2.3. Length

Determining the length of Fabric Ducting & Diffusers depends primarily on the availability of space.

We can manufacture a fabric diffuser to deliver the same air volume whether the duct is short or long, the precise design depends on the material type, perforation designs and system pressure.

CUSTOMARY PARTS & LENGTHS



A - Beginning (edge /zip) – length 100 mm - 200 mm

B - Continuous part (zip/zip) – length 5000 mm –10000 mm, these are multiplied to create the correct duct length

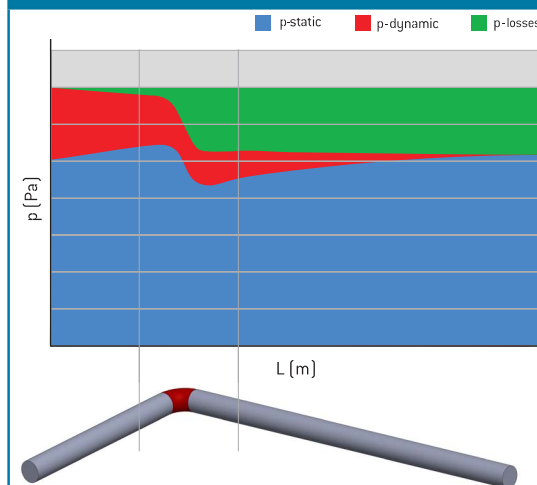
C - Blind part (zip/end) – length from 100 mm to 11000 mm

- Individual parts are connecting with zippers; the number of zippers (or the distance between them) is flexible and can be specified by the customer.
- Only the overall length in mm ($A + B + C$) is provided in the specification, the ducting and diffusers are separated into segments during production.

2.4. Pressure

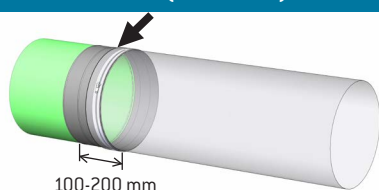
Pressure losses of Fabric Ducting & Diffusers are very similar to those in the traditional ducting. Calculating a more complex fabric distribution system is achieved using similar methods to those for sheet metal ducting. The minimum static pressure necessary to keep the correct shape of a Fabric Duct or Diffuser depends upon the weight of the fabric used. A minimum of 20 Pa is sufficient for light materials and 50 Pa necessary for medium and heavy ones. The pressure distribution along Fabric Diffusers is different from traditional sheet metal ducting because with declining airflow longitudinal velocity decreases. To verify the design of your fabric distribution system, please contact us.

Pressure distribution in a Fabric Diffuser

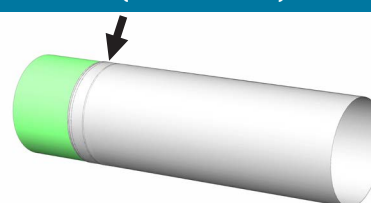


2.5. Possible End Alterations

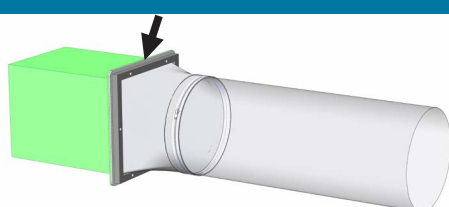
F BEGINNING (WITH ZIP)



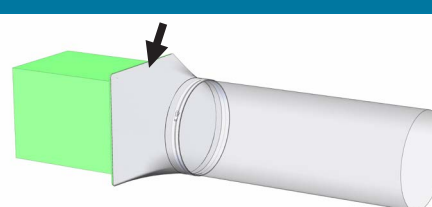
H HEM (WITHOUT ZIP)



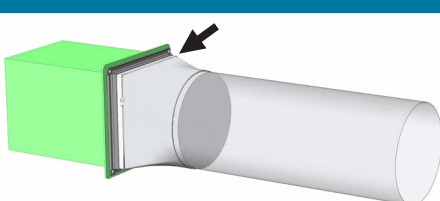
WOUT OUTER WING



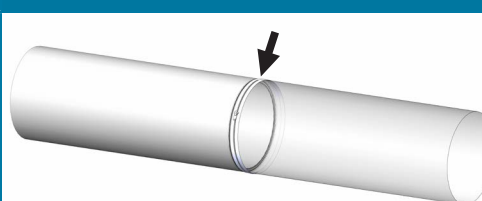
WIN INNER WING



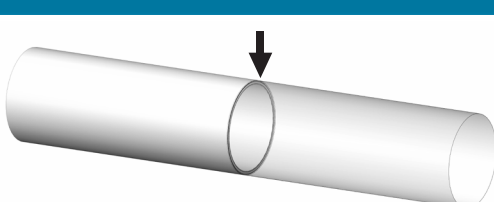
P BEGINNING PLASTIC



Z ZIP










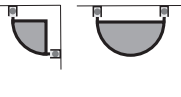



S STITCHED



B BLANK END



3. Installation

| Installation no. | Cross section view | Type of suspension | Additional accessories designation (see overview chart below) | |
|------------------|---|--------------------|--|---|
| 0 | without mounting material and hooks or enlarged strips | | | |
| 1 |  | wire | D, F, K, M | |
| 2 |  | wire | D, F, K, M | |
| 3 |  | profile, velcro | A, B, C, G, J, L, H | |
| 4 |  | profile | B, C, G | |
| 5 |  | suspended profile | A, B, C, G, I, D, E, F, K, L, M | |
| 6 |  | suspended profile | A, C, G, I, D, E, F, K, L, M | N |
| 7 |  | tensioner | D, F, H can be added to all other installation types | |
| 8 |  | profiles, velcro | A, B, C, G, L, H, J | |
| 9 |  | profiles | A, D, E, F, K, L, M | |
| 10 |  | profiles | A, L | |
| 11 |  | profiles | A, E, K, L, M | |

Hook



Aluminium profile



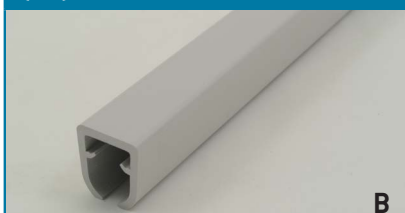
Plastic coated wire (galv.) and galvanized mounting material



Enlarged strip
[A]



Plastic profile
[B]



Aluminium profile with hangers
[C]



Plastic coated wire (galv., stain.) and stainless mount. m. [D, F]



Threaded bar
[E]



Profile connectors



Stainless profile
[G]



Tensioner at blank end
[H]



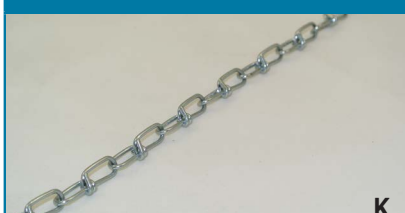
Reinforced aluminium profile
[I]



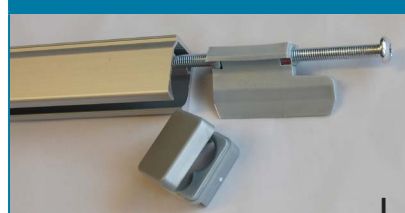
Velcro
[J]



Galvanized chain
[K]



Screw tensioner in the profile
[L]



Gripple hangers - upper parts
[M]



Gripple hangers - lower part
[M]



Arch hanger of profiles
[N]



4. Design Features

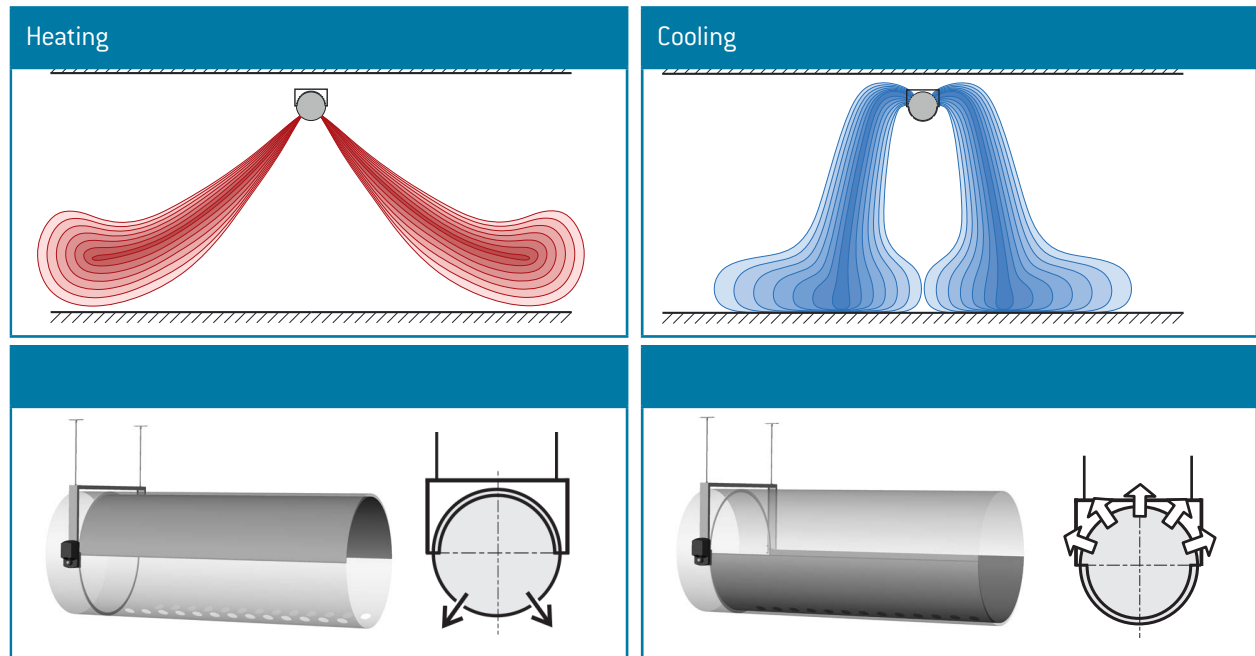
We offer a solution for every situation. Everything is tested by our qualified developers in a modern testing chamber. All products are custom-made and we are ready to meet your specific requirements for specific equipment or designs which are not listed here. Feel free to contact us.

4.1. Products for special use

Membrane Diffuser

Diffuser for two different supply air modes

This combines two types of diffuser into one. The beginning of the membrane is a lightweight non permeable material sewn all along the duct length. The end of the membrane is attached to a flap, which is controlled by a servomotor or manually. In heating mode the motor moves the membrane to cover the cooling diffusers located at the top of the duct, the supply air exits the heating perforations on the bottom of the duct. In cooling mode the motor moves the membrane to cover the heating perforations at the bottom of the duct and the cool supply air leaves the perforations at the top of the duct. The membrane allows two totally different diffusion styles in one duct.

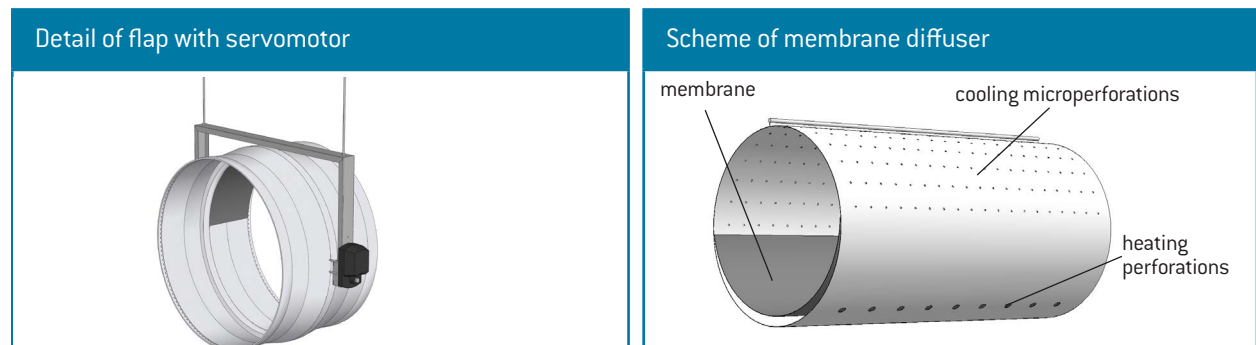


FLAP

Used for switching between the two modes. It is made from Classic (PMS/NMS) or Premium (PMI / NMI) material, depending upon the duct specification; the internal spigot and external frame are made from galvanized steel. The length is always 400 mm. The flap includes a servomotor 220 V or 24 V, or it is altered for manual control.

DIFFUSER

The membrane always covers one half of the diffuser and leaves the other open to supply air.

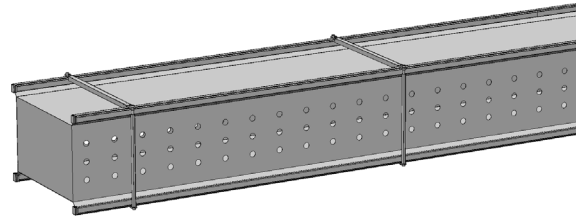


Negative Pressure Ducting

We supply these only in square cross-sections. One of the conditions of a proper function is flawless stretching of the fabric in the longitudinal as well as transverse directions. The longitudinal stretch is ensured by tensioners in the profiles, while the transverse stretch is ensured by tensioning crossbars. Air is drawn into the duct through perforations that can be positioned on any side and anywhere along the length of the duct. To ensure equal extract rates we can adjust the perforation diameters or the gaps between the perforations progressively along the duct. We anticipate our negative pressure ducts will be used where regular and/or thorough cleaning is required. Negative pressure fabric ducting is relatively easily disassembled from the suspension system and unzipped into smaller washable parts.

Fabric Ducting for removing air

Square fabric negative pressure ducting with a stretching structure



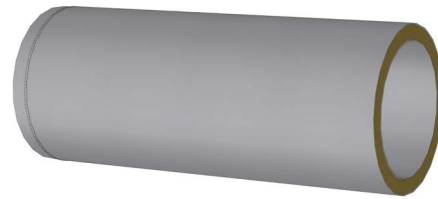
IMPORTANT NOTE: For impermeable fabrics only

Insulated Ducting

Used to reduce heat losses when overcoming sections which are not air conditioned or to prevent condensation. The insulation consists of a 30, 20 or 10 mm thick layer of non-woven polyester fabric with fire resistance class B-s2,d0 as per EN 13501-1. That is sewn in between the inner (light) and outer (usually medium) fabric. Sewing reduces the width of the insulation a bit. The achieved heat transmission coefficient is 1.2 W/m²/K for 30 mm, 1.7 W/m²/K for 20 mm and 2.8 W/m²/K for 10 mm insulation.

Thermal insulation

Insulated duct

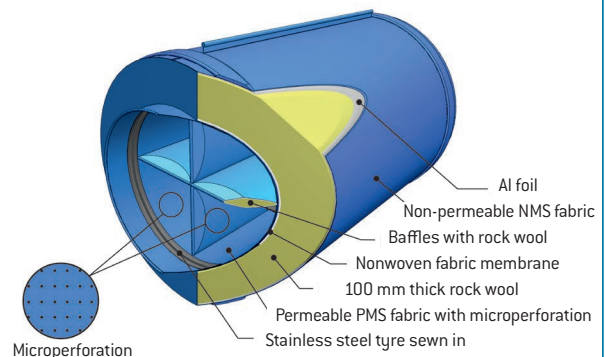


Fabric Noise Attenuator - QuieTex

We use 100 mm thick rock wool with aluminium foil to manufacture the fabric noise attenuator, which is covered on both sides with fabric. Greater damping is achieved using microperforated fabric inside.

Noise attenuation

Construction of the QuieTex noise attenuator



Noise attenuation values in dB [for diameter 400]

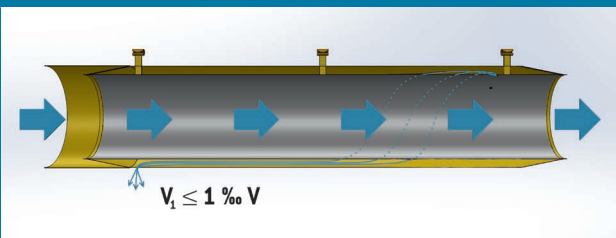
| Hz | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz |
|-------------------------|-------|--------|--------|--------|-------|-------|-------|-------|
| Fabric noise attenuator | 6 | 11 | 15 | 23 | 29 | 35 | 30 | 20 |

Double Ducting

Condensation is mostly prevented by the use of double ducting. The interlayer is maintained in the correct position by a negligible flow of air [about 1 ‰ of the ducting flow]. The heat transfer coefficient reaches up to 3.5 W/m²/K.

Prevention of condensation

Principle of Double ducting

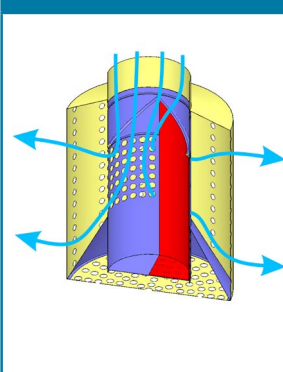


Lantern with Membrane

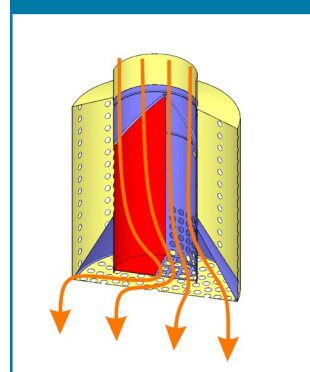
Original inside construction based on double walls and impermeable membrane allows switching direction of airflow. Air can be supplied either horizontally into all sides or vertically downwards, in both cases through perforated fabric. Switching can be controlled by servomotor or manually. Beside stainless steel wire of the switching flap all the rest is made of fabrics and can be cleaned in washing machine. The diffuser is very light and its installation requires fixing to air supply only.

Large volume diffuser

Horizontal outlet



Vertical outlet



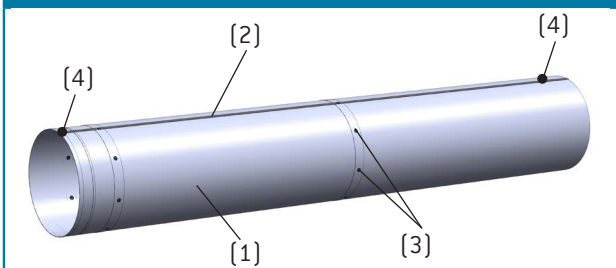
Antistatic Design

Antistatic design is intended for rooms, where a build up or uncontrolled discharge of static electricity must be avoided. Our Antistatic system consists of 4 measures:

1. A conductive fabric Premium (PMI, NMI)
2. A highly conductive strip installed all along the length of the duct
3. All zippers are equipped with metal joints
4. Earthing points at the ends of the duct

Removal of electrical energy build up

Antistatic duct design features

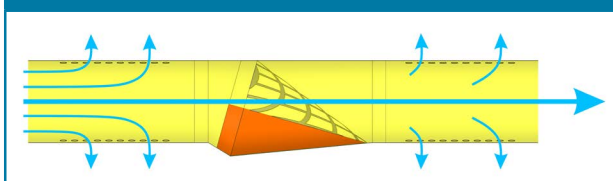


Fabric Shutter

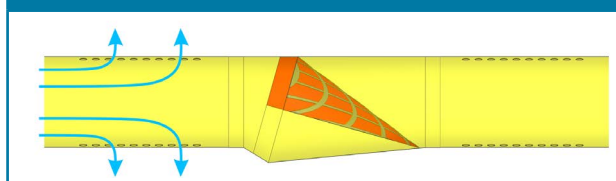
Duct closing

Fabric shutter closes whole cross-section of diffuser or ducting and avoids air distribution or air transport into area behind its location. It is made of fabric with removable inside metal construction of a thin rod. The internal conical membrane closes the cross-section with supporting fabric grill or leaves it open. It can be operated manually or by servomotor.

Shutter open



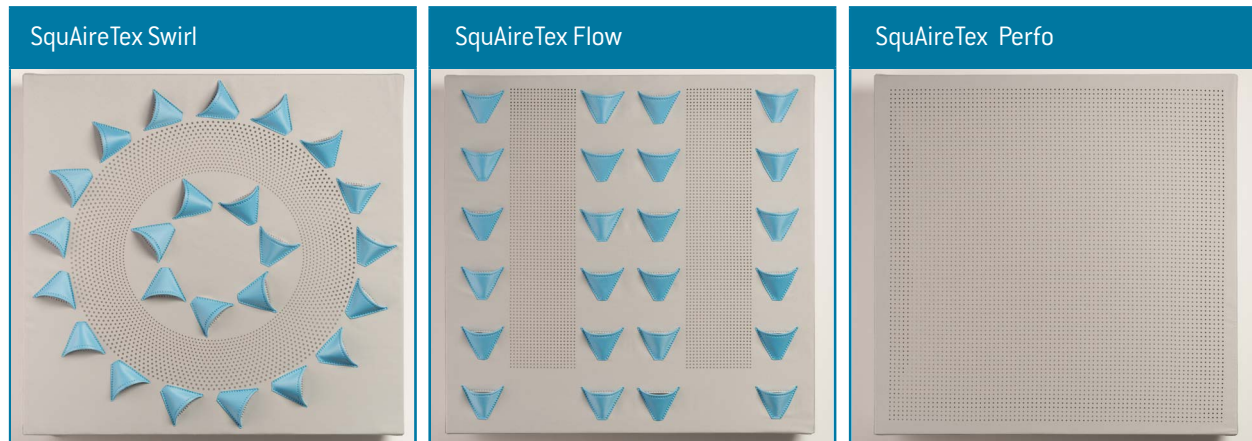
Shutter closed



Fabric Tiles SquAireTex®

Fabric Tiles for walls and ceilings

SquAireTex fabric tiles provide a great solution for mixing of supply and ambient air. The construction is based upon fabric pockets which are sonic welded on to a fabric tile which is mounted upon a aluminium frame. SquAireTex diffusers are very easy to install as there is no fixing required. Thanks to its very low weight it can be laid directly into the false ceiling frame. The complete diffuser is easily removed from the frame for washing. 9 fabric colours are available which can be freely combined or any Prihoda Art motif. The connection box has been designed to optimise uniform air delivery and can be made from insulated material. There are 3 types of SquAireTex diffuser, Swirl, Flow and perfo all are described in more detail in their own special brochure...

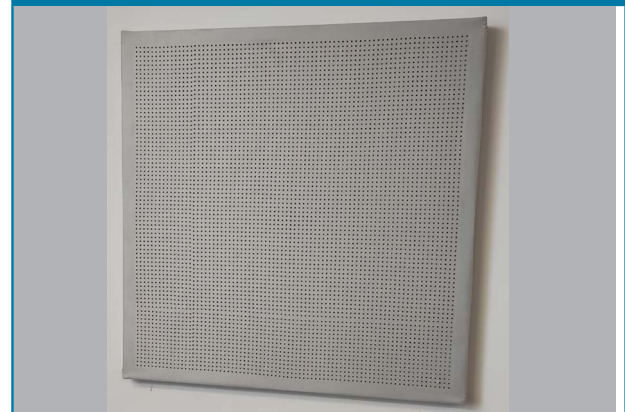


Distribution wall panels

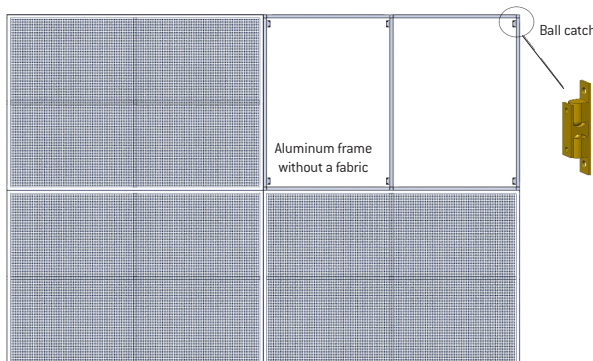
Even air output from a large area

The wall fabric panels ensure an even air output from a large wall opening thanks to the air passing through two layers of a perforated fabric. The fabric is stretched over an aluminum frame and fastened using Velcro fasteners for easy dismounting for washing in a washing machine. The frame is fastened to the wall on a ball catch or inside of the opening on an auxiliary frame. The smallest panel size is 600 x 600 mm, while the largest is 1,500 x 1,500 mm. The panels can be installed side by side into a bigger area. We use a PMS fabric with a perforation that is 2 mm in diameter. To direct the air flow along the walls, fabric pockets can be added. We supply the panels in any color or with a Prihoda Art motif.

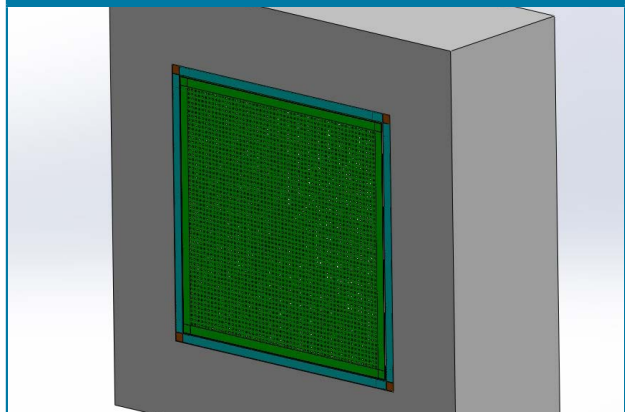
Distribution wall panel



Four parallel panels



Installation inside of an opening

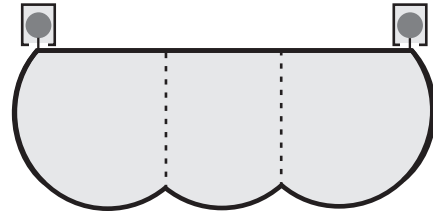


Combined half-round section

High flow rate at low diffuser height

This is a combination of several half-round diffusers sewn together side-by-side. It enables higher air volumes with a relatively small duct height.

Example of combined half-round section



4.2. Solutions for long airflow distance

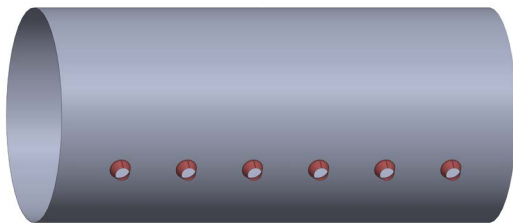
Small Nozzles

For directed air patterns and long airflow distance

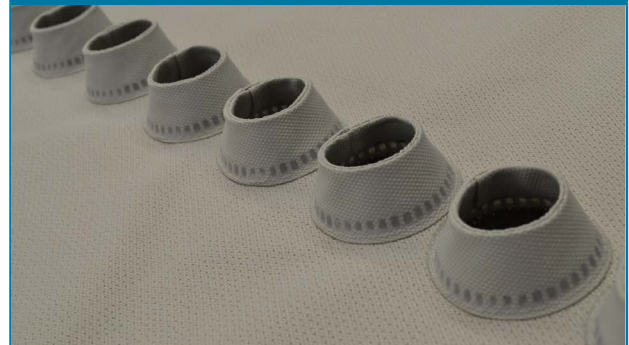
Small nozzles allow directed air patterns. Airflow is extended by circa 25 % in comparison to standard perforations and deflection minimized. The small nozzles exist in three diameters 20, 30 and 40 mm and in two variants, industrial and premium.

IMPORTANT NOTE: For fabric Classic (PMS, NMS), Premium (PMI, NMI), Durable (NMR), Recycled (PMSre, NMSre) only

Typical arrangement of small nozzles on the diffuser



Row of small nozzles

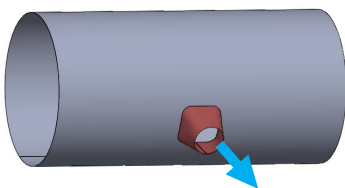


Big Nozzles

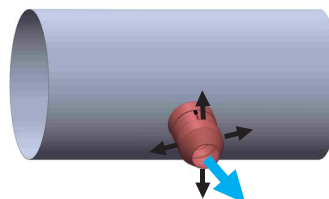
For Maximum airtrow distances

Our big nozzles allow the longest airtrow distances. Range can exceed 20 m depending upon static pressure and temperature difference. Nozzles can be fixed, adjustable or directed. An adjustable damper can be sewn into every nozzle to allow variable flows.

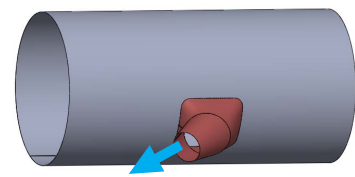
FIXED nozzle



ADJUSTABLE nozzle



DIRECTED nozzle

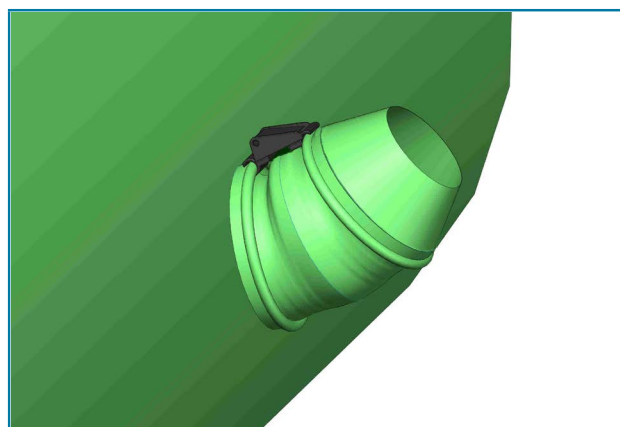
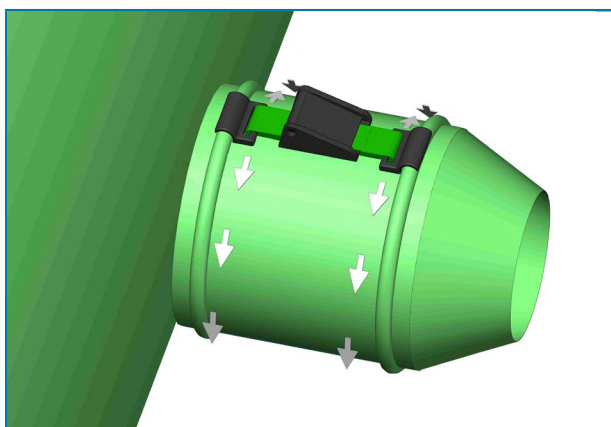
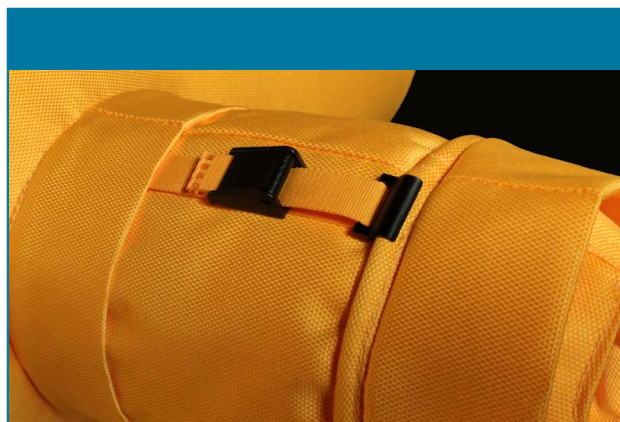
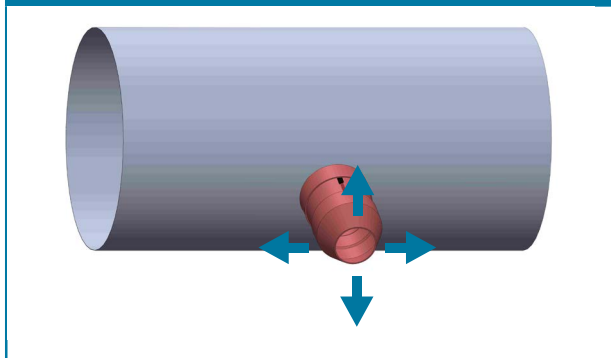


Adjustable nozzle

For Maximum athrow distances

The nozzle can be directed (bent) by adjusting the length of the strap that connects its ends. The strap can be arbitrarily moved along the perimeter of the straight part of the nozzle. The range of the setup is limited by a spherical sector with an angle of 60°. The adjustable strap is covered by the fabric collar.

Principle of adjustable nozzle



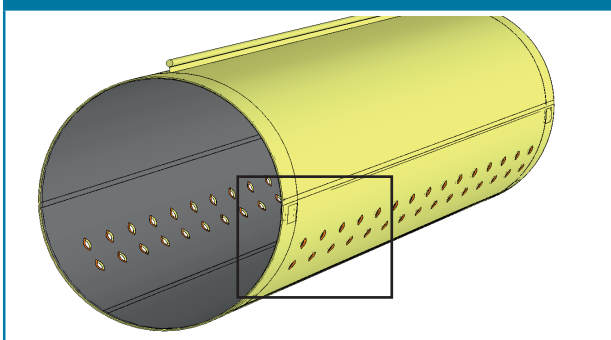
4.3. Products with adjustable parameters

Adjustable Perforation

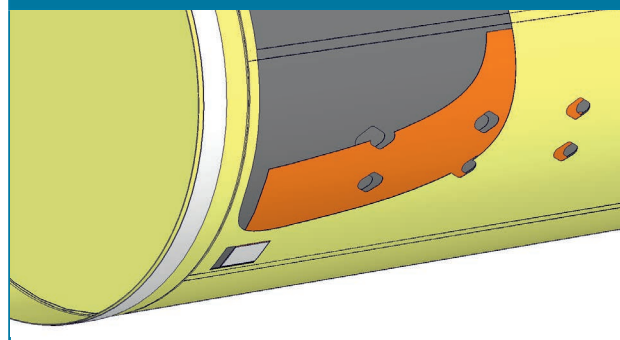
Setting airflow

It allows for manual for manual adjustment of the diffuser hole size and airflow. The pictures below describe the operation - actual diffuser sizes and hole patterns are completely variable depending upon the project requirements. The chosen position is retained using velcro.

Diffuser with adjustable perforation



The part with perforation is made of three layers of fabric



Closable Nozzles

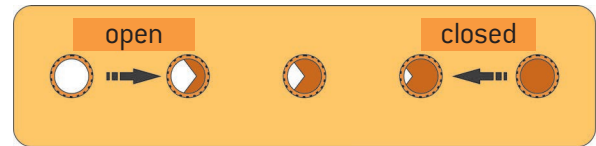
Regulation of air flow

Small nozzles can be blanked off by a band of perforated fabric placed behind the nozzles. The band moves between two fabric layers and opens or closes the nozzles. The required positioning is retained using velcro. If the nozzle is only partially opened, the flow is unstable and can change direction. The number of nozzles controlled by a fabric band is optional.

The maximum length of one closing band is 1,2m

| Nozzle sizes | Maximum number of nozzles |
|--------------|---------------------------------------|
| 20 | 7, flow 87m ³ /h at 100 Pa |
| 30 | 5, flow 144m ³ /h at 100Pa |
| 40 | 4, flow 210m ³ /h at 100Pa |

Option to blank off certain nozzles



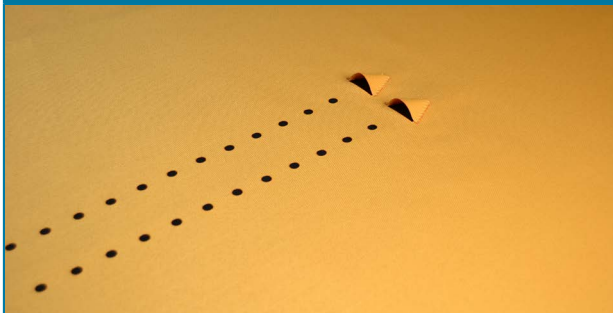
4.4. Solutions of problems with air flows

Pockets

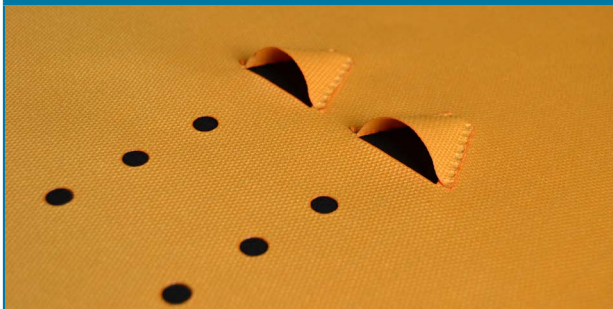
Solution for deflection of flows from perforation

Fabric pockets are designed to remove the deflection of air leaving from the perforation. The solution is based on interaction of two air flows of similar momentum. Discharge from the last hole in the row is directed at a certain angle using a fabric pocket and balances the air deflection from perforation.

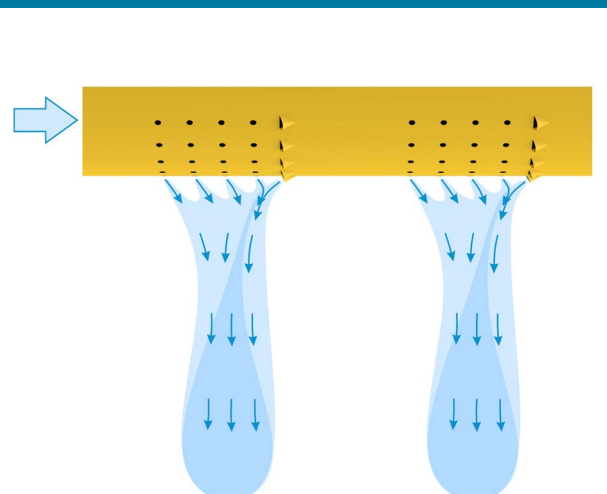
Fabric pockets on the diffuser



Detail of fabric pockets



Function of Fabrics Pocket

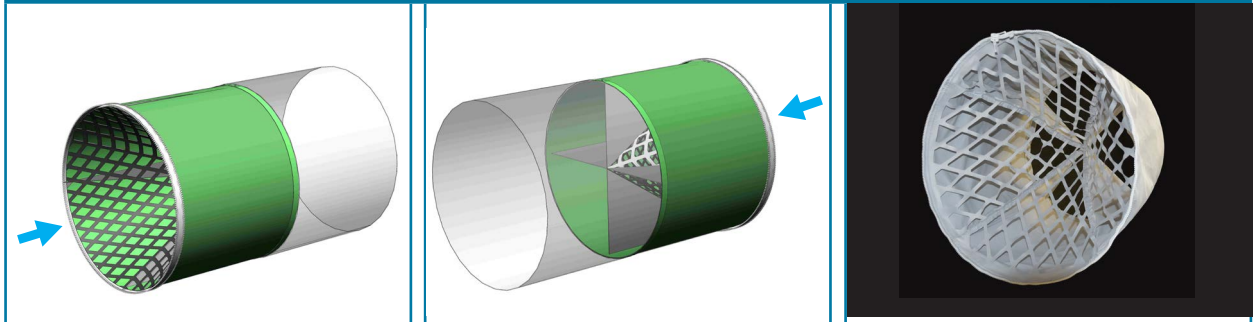


Equaliser

Airflow turbulence reduction

It is used for evening the flow, for example, past a ventilator or a shaped piece. Its installation can eliminate fabric vibrations. However, it does represent yet another pressure loss.

EQ - cone made of a perforated fabric with star-shaped crossbars



Damper

Equalising static pressure within a duct

The Damper is a short cone made of fine mesh fabric. The inlet of the damper is normal duct diameter whilst the outlet can be adjusted to a smaller diameter, by use of an adjustable belt. Maximum opening of the damper outlet results in zero pressure loss, whilst fully closing the outlet provides the highest local pressure drop. The damper setting can be adjusted at any time by opening a zip on the duct circumference. By installing a damper part way along the duct one can equalise the static pressure within the duct and therefore the air flowing from each point along the duct. We also use dampers to provide flow control through Fabric Nozzles and outlet spigots to other parts of a system.

Damper

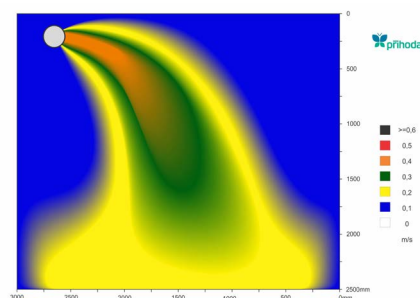


Diffuser for Intensive Cooling

For cooling with a high temperature difference

For cooling applications with a $\Delta t \geq 6^\circ \text{K}$ we recommend using horizontal air patterns from the Fabric Duct. This can be achieved by placing the micro-perforations in a band on either side of the duct at 90° and 270° . The horizontal airflow pattern must achieve a specific speed in order to prevent premature downward deflection. With sufficient outlet speed (provided by static pressure) it is possible to introduce 400 W of cooling capacity per 1 m duct length, whilst maintaining a velocity below 0.2 m/s in the occupied zone. The air flow patterns are detailed in the illustrations below, please contact our authorized representatives for specific applications.

Airflow patterns, microperforation 90° , 165 Pa

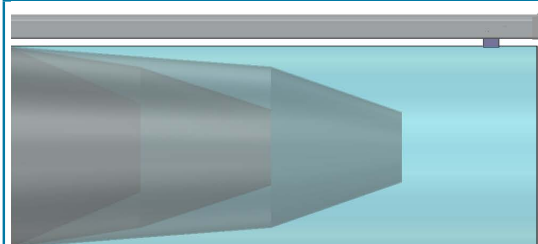


Beat Absorber

Elimination of Airflow impact on diffuser's end

The Beat Absorber is composed of three connected truncated fabric cones which eliminate the sudden impact of the supply air on the end of the Fabric Diffuser upon unregulated start up. This is available in new ducts and can also be retrofitted into existing systems.

Beat Absorber is composed from three truncated cones



Anti-deflector

Anti-deflector prevents the deflection of airflow from fabrics micro-perforated with holes larger than the thickness of the fabric. It is made of a fine mesh and covers the diffuser from inside. Our calculation software recommends its use whenever deflection could occur.

For cooling with a high temperature difference

Detail of diffuser with anti-deflector



4.5. Appearance improvement

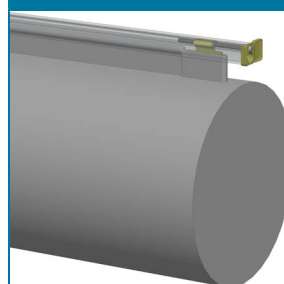
Tensioner in the profile

Screw tensioners slide into the profile are used to remove wrinkles and creases in the fabric. The flexibility of the fabric allows it to stretch by up to 0.5 %. Pre-stretched diffusers are therefore manufactured 0.5 % shorter than specified and the true length is achieved when tensioning. The installation procedure is specified in the assembly instructions included in all deliveries.

IMPORTANT NOTE: We recommend using tensioners whenever possible in all aluminium profile installations.

Straightening of small wrinkles

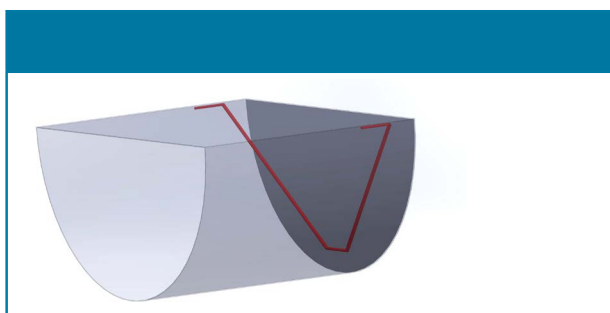
Principle of tensioner in the profile



End Support

A metal spring wire tensions the plastic insert in the blank end improving the look of the end of the diffuser.

Improved shape of blank end



End Tensioning

Stretches the whole length of the diffuser

Anchored into the wall in the axis of the diffuser



Anchored into the wall or ceiling

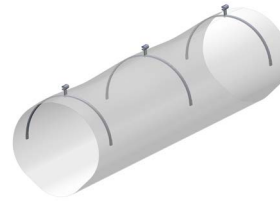


Arcs

Used for improving ducting/diffuser shape without air inlet. Arcs ends are inserted into pockets sewn on the internal ducting wall; they are fastened in the middle by a Velcro attachment. They are disassembled during maintenance. It provides a cheaper alternative to tyres.

Prevents textile from sagging

Diffuser with arcs without air supply

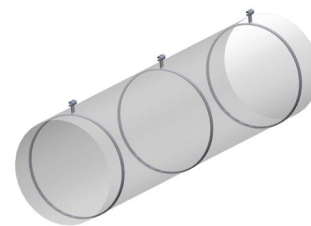


Tyres

Made of a flat aluminum profile, a stainless steel wire or fire resistant plastic. Each material has its advantages and limitations. Only circular shapes can be made of plastic. Installed with appropriate spacing using Velcro fasteners which allows them to be dismantled during maintenance.

Maintains diameter

Circular diffuser with tyres

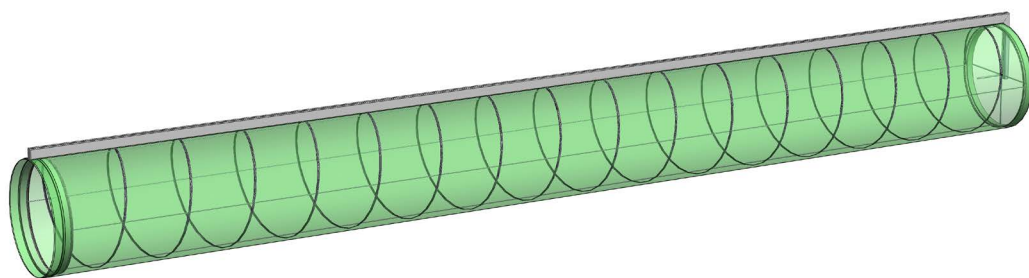


Helix reinforcing system

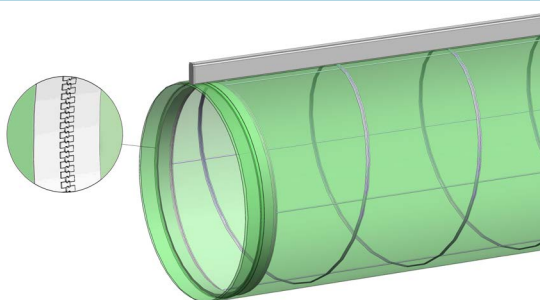
Straightening the shape

The fabric-covered metal spiral is inserted inside the duct; it maintains permanently its cylindrical shape and keeps the fabric stretched. The necessary lead of the spring is provided by longitudinal textile strips. Five-metre long Helix sections are connected to zip fasteners attaching separate sections of the ducting together. The spiral can be easily removed for maintenance purposes; its manufacturing design is suitable for a majority of shaped pieces. The necessary tension of the fabric will be achieved by the tensioners in profile and in blanking. We also produce Helix in a cheaper ECONOMY variant, with a greater gradient of the spiral and a smaller number of longitudinal strips.

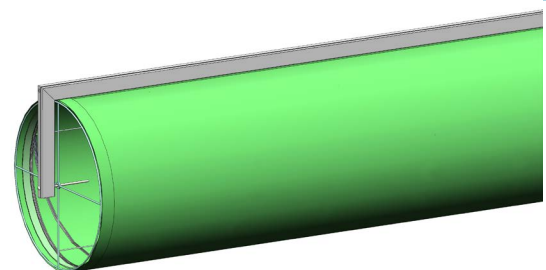
Helix reinforcing system



Detail of beginning



Detail of end

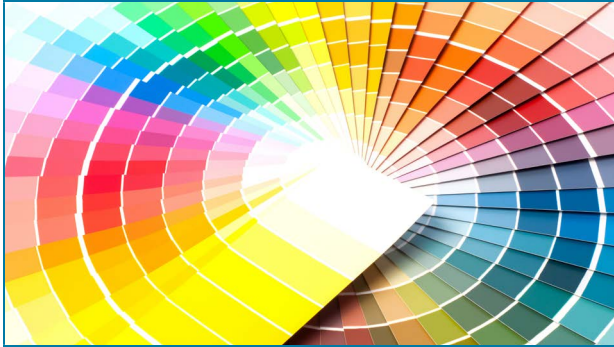


Prihoda Art

Ducting doesn't need to be boring

Manufacturers of sheet-metal pipes do not offer the chance to display a company logo or themed photos, but Přihoda textile outlets give you this opportunity. Our fabric dyeing technology gives products a new aesthetic dimension, enabling them to become an interesting feature in any interior. We are able to produce textile outlets and air ducts in any Pantone colour, with any pattern, photograph, image, logo or inscription, regardless of how complex they are. We guarantee that the colours and images will not fade, even when washed regularly

Special colours



Structures of building materials



Logos



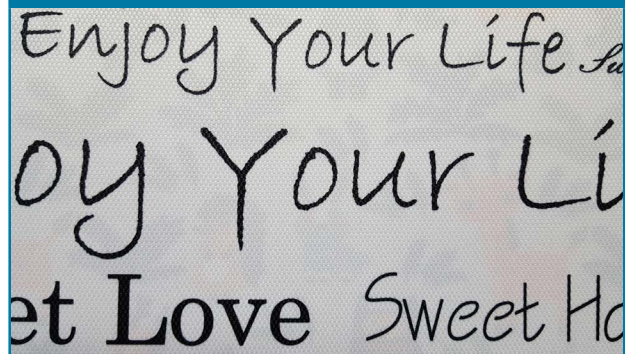
Patterns



Photos



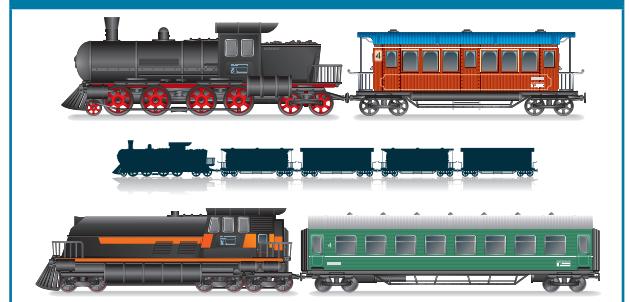
Writings



Product photos



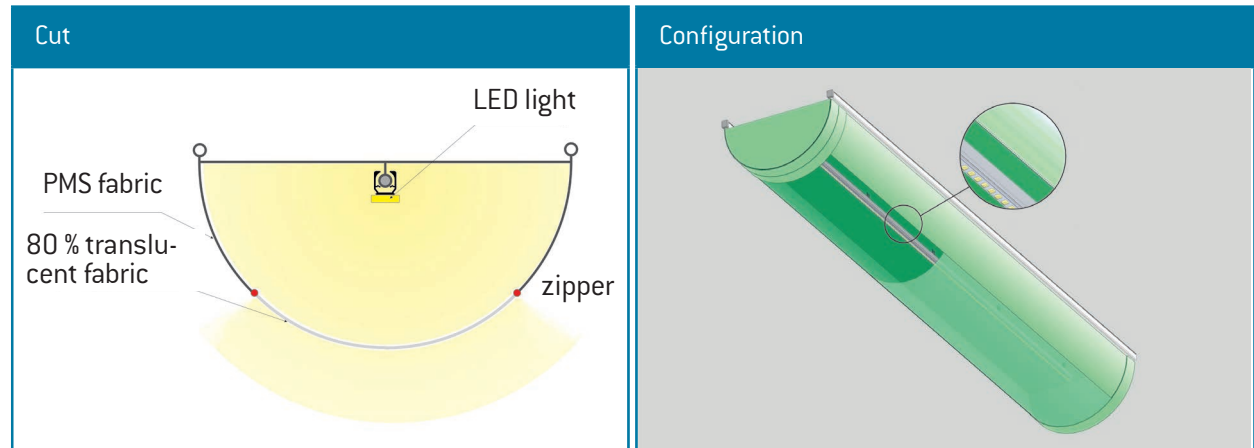
Illustrations



LucentAir

Combination of lighting and ventilation

LucentAir diffuser combines air supply with room lighting. Fabric walls are partly made of highly light transmitting fabric (80 %). These parts, usually strips, are connected by zippers to allow cleaning. Source of light (LED strips usually) is fixed on an aluminium profile inside of diffuser. We supply the hanging profile but not the light source. This has to be solved by a specialist.



Office design

Details for improved appearance

Products marked in this way contain several details to improve their appearance. Office design means:

- Connection strips covered by fabric
- Plastic reinforcement of the blind ends
- At non-circular shapes the plastic reinforcements can be held in correct position by metal construction
- At non-circular shapes the blind ends have soft strips and additional piece of profile to cover up the gap between diffuser and ceiling/wall.
- Smallest possible number of fabric parts used i.e. minimum number of lengthwise seams

4.6. Mounting simplification

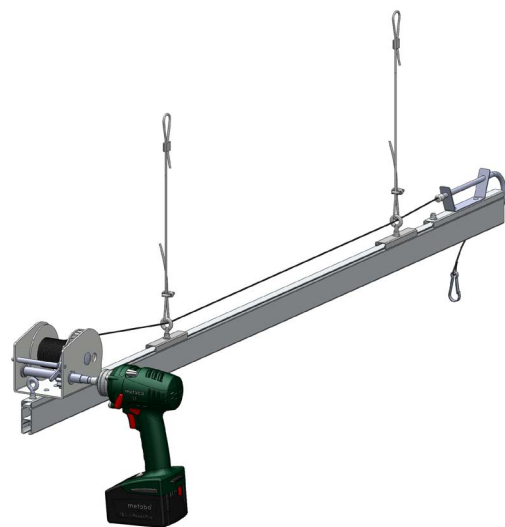
Winch

Mounting and demounting from one place

The whole Fabric Duct can be installed from one end of the installation using a Prihoda winch. This significantly simplifies installation and removal. This system is particularly useful where the fabric ducts are mounted over swimming pools or technical machinery where access is limited.

CONDITIONS OF USE: The winch system is suitable for installations 5, 5D, 5F, 5I, 5DI, 5FI exclusively.
Maximal weight of diffuser: 100 kg

Winch winding using approved site tools



5. Material

5.1. Important Benefits

As a company PŘÍHODA s.r.o. places tremendous importance on the quality of the materials used. In every case we use specially developed materials that have been subjected to extensive development testing in order to achieve maximum performance benefits for our customers. The Prihoda Premium (PMI/NMI) fabrics provide all the benefits listed below as part of our standard design (at no additional cost).

| | |
|----------------------------|---|
| High rigidity and strength | Our basic Classic, Premium and Recycled (PMS/PMSre/NMS/NMSre/PMI//NMI) fabrics demonstrate optimum rigidity of 1800 N/10mm in the texture and 1000 N/10mm in the weave. These parameters make tearing of the material in normal use almost impossible. |
| High fire resistance | The PMI/NMI/PMS/NMS fabrics are certified to European standard EN 13501-1 with excellent results. In this test our fabrics achieve B-s1,d0 classification, which means prevention of spread of fire, minimum smoke production and no burning drops. Glass (NHE) fabrics in fact meet class A requirements. Classic and Premium (PMI/NMI/PMS) fabrics are also certified to US norm UL 723. |
| Negligible fibre shedding | Due to the use of endless fibres, ALL of our fabrics can be used in cleanrooms up to ISO Class 4. Independent laboratory tests demonstrate that there is practically no particle shedding from our material during operation. |
| Antistatic effect | Woven carbon fibre in Premium (PMI/NMI) and Durable (NMR) materials removes any build up of electric charge from the surface of the fabric. |
| Antibacterial effect | We utilise a special treatment which guarantees that no bacteria can survive if settled on to our fabric Premium (PMI/NMI) and Durable (NMR). This treatment remains effective after multiple washing. Tests for the European standards found that after TEN washes there was no reduction in the efficacy of the treatment. This allows us to offer a 10 year warranty on the basis of our minimal maintenance requirements (see the following point). |
| Easy to maintain | Our fabrics which are manufactured using endless fibres are very effective and minimize settlement of impurities from the supply air. This supply air is distributed through the diffuser perforations, and the Fabric Ducts remain relatively clean inside (in a normal environment). They do not require any other maintenance than outer dusting. Washing is normally only required for either hygiene or aesthetic reasons. |
| Stable Appearance | Thanks to our endless fibre technology, the appearance of the fabric does not change over time, or with multiple washing cycles, unlike materials made of basic fibres. Our Premium, Classic a Recycled (PMI/NMI/PMS/NMS/PMSre/NMSre) materials remain aesthetic after many maintenance cycles. |

| Designation | Permeability | Weight | Material | Characteristic | | | | | | | | | |
|--------------------------------|--------------|--------|------------------|----------------|-------------------------|------------|---------------|------------------|--------------------------|----------------------------|-----------------------------|-----------------|---|
| Prihoda Premium (PMI/NMI) | yes/no | medium | 100% PES | ● | B | ● | ● | ● | ● | 9 | ● | ● | ● |
| Prihoda Classic (PMS/NMS) | yes/no | medium | 100% PES | ● | B | ● | ● | ● | ● | 9 | ● | ● | ● |
| Prihoda Recycled (PMSre/NMSre) | yes/no | medium | 100% PCR PES | ● | B | ● | ● | ● | ● | 9 | ● | ● | ● |
| Prihoda Light (PLS/NLS) | yes/no | light | 100% PES | ● | B | ● | ● | ● | ● | 9 | ● | ● | ● |
| Prihoda Durable (NMR) | no | medium | 100% PES | ● | B | ● | ● | ● | ● | 1 | ● | ● | ● |
| Prihoda Glass (NHE) | no | heavy | 100% GL, 2x PUR | ● | A | ● | ● | ● | ● | 7 | ● | ● | ● |
| Prihoda Plastic (NMF) | no | medium | 100% PES, 2x PVC | ● | B | ● | ● | ● | ● | 4 | ● | ● | ● |
| Prihoda Foil (NLF) | no | light | 100% PE | ● | ● | ● | ● | ● | ● | 1 | ● | ● | ● |
| Prihoda Translucent (NMT) | no | medium | 90% PVC, 10% PES | ● | C | ● | ● | ● | ● | 1 | ● | ● | ● |
| | | | | antibacterial | fire resistance (class) | antistatic | high strength | machine washable | suitable for clean rooms | number of standard colours | special colours/Prihoda Art | water repellent | |
| | | | | ● | yes | ● | no | | | | | | |

5.2. Selection of the most suitable material

1) Classic (PMS, NMS) or Premium (PMI, NMI)

Fabric Premium is unlike Classic in addition antibacterial and antistatic. Through these properties they are predetermined to use in the environment with the highest hygienic requirements or where it is necessary to prevent arising electric voltage between textile diffuser and earthing. Although the both categories reach usually the rank for the same class according to the flammability, fabric Premium are besides equipped with the special modification for minimization of combustion and fumes.

2) Air-permeable (PMS, PMI, PLS) or non air-permeable (NMS, NMI, NLS, NMR)

The only reason for usage of the air-permeable materials is need to prevent the water condensation on the surface of the diffusers. When in cooling with the temperatures under the dew point the non air-permeable material will behave like steel ducting and it is necessary to use air-permeable fabric, alternatively double or insulated ducting.

3) Light materials (PLS, NLS)

Their lower price is balanced with shorter warranty and life-time. Compared to other fabrics, these light materials are easy to wear out by washing and they will not last more than 50 washing cycles. Thanks to extreme low weight they are pleasant to touch in manipulation.

4) Foils and coated fabric - Foil (NLF), Plastic (NMF), Glass (NHE), Translucent (NMT)

They can't be washed in the washing machine, but on the other hand it is possible to clean them with the water flow and with wiping. Foils are the most convenient material with regard to price.

5) Recycled materials (PMSre, NMSre)

They are made of fibers gained through recycling of PET bottles and their usage will contribute to the protection of the environment. Every square meter of this fabric saves 13 PET bottles from the waste dump. Recycled materials are technically equal to category Classic.

6) Colour choice

Most materials are generally available in 9 colours, which roughly correspond to the following range. When using Prihoda Art technology (see page 22) any RAL or Pantone colour can be chosen, favourite motifs, company logos or photographs. It is suitable for all materials which are 100 % PES.

| | | | | | | | | |
|---|---|---|---|---|--|---|---|---|
| RAL 9016 | PANTONE 135 (RAL 1017) | PANTONE 420 (RAL 7035) | PANTONE 424 (RAL 7037) | PANTONE 341 (RAL 6024) | PANTONE 187 (RAL 3001) | PANTONE 2915 (RAL 5012) | PANTONE 7462 (RAL 5005) | PANTONE 419 (RAL 9017) |
|  |  |  |  |  |  |  |  |  |
| WH | YE | LG | DG | GR | RE | LB | BL | BC |

Please ask for a sample book if you wish to see or match a precise colour or shade.

6. Maintenance and Warranty

All our ducting&diffusers are made from high quality and highly resistant materials without natural fibre additives. The material used is specified within the technical description of your order. If the diffuser is equipped with any removable non-textile elements (such as tyres, reinforcement of blankings, frames, connecting strips etc.), these need to be removed before washing.

How to wash and clean fabric ducting&diffusers

1. Textile diffusers and ducts that can be washed in a washing machine

Materials: Prihoda Classic (PMS, NMS), Prihoda Premium (PMI, NMI), Prihoda Light (PLS, NLS), Prihoda Recycled (PMSre, NMSre) Prihoda Durable (NMR), Prihoda Hydrophobic (NLW)

- 1.1. Heavily polluted diffusers should be first dusted using a vacuum cleaner (compressed air, soft brush).
- 1.2. When the diffuser is more polluted inside, turn it to its reverse side prior to washing.
- 1.3. For machine washing use industrial detergents (dosing in accordance with the given manufacturer recommendations). Use washing programs for 40 °C, with spinning between 400-800 rpm and intensive rinsing.
- 1.4. Use washing agents for professional use (we can recommend some of them upon request), however, you can use regular washing detergents as well.
- 1.5. Repeat the washing cycle if necessary.
- 1.6. Should it be required by the given local operation regulations at the installation location, add a disinfection agent to the washing detergent. The chemicals in the disinfection agent must not affect the fabric. Dosing in accordance with the given manufacturer recommendations.
- 1.7. Dry and install the diffusers after washing. The air that passes through can be conveniently used for their complete drying. Fabric diffusers must not be dried in any dryer!
- 1.8. Surface (induction) dirt can be usually removed by a vacuum cleaner directly from the installed diffusers. We recommend using an extension with a brush.

2. Textile diffusers and ducts that cannot be washed in a washing machine

Materials: Prihoda Plastic (NMF), Prihoda Foil (NLF), Prihoda Glass (NHE), Prihoda Translucent (NMT)

- 2.1. Dirt can be usually sufficiently removed by a vacuum cleaner or compressed air from the outside as well as from the inside of the diffusers.
- 2.2. Should the vacuuming not be sufficient, clean the diffusers using a wet or dry sponge, soft rag or brush, depending on the given dirt type.
- 2.3. The diffusers can be also washed by hand in a washing agent solution and manually rinsed (maximal water temperature is 40 °C). Let the water drip and material dry after rinsing. Fabric diffusers must not be dried in any dryer! The air that passes through the diffusers can be conveniently used for their complete drying.
- 2.4. Surface (induction) dirt can be usually removed by a vacuum cleaner (we recommend using an extension with a brush) or by wiping using a wet rag directly on the installed diffusers.

Legend for symbols

| | |
|--|--|
| | Machine wash at max. temperature of 40°C, normal mechanical action, normal rinse, normal spin cycle. |
| | Light mechanical action, rinse at falling temperature, light spin, gentle machine wash, max. temperature 40°C. |
| | Hand wash only, do not machine wash, max. temperature 40°C, handle gently. |
| | Do not bleach product. |
| | Do not dry the product in a rotary drum drier. |
| | Iron at a max. temperature of 110°C, use caution when steam ironing. |
| | Do not iron product; steaming and steam processing is prohibited. |
| | Do not dry clean product, do not remove spots using organic solvents. |
| | The product is safe to dry clean using perchlorethylene and all solvents specified under the symbol F. |

Any maintenance must strictly follow the washing label symbols sewn into every section.

pos01-part01-of02

OP 182250

High Tech-CM.1351

NMI 100% polyester



PŘÍHODA s.r.o.

Tailor-made
Air Ducting&Diffuser

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tel.: +420 469 311 856
fax: +420 469 311 856
info@prihoda.com
www.prihoda.com

Made in EU - Czechia
in September 2018

☐ Number of the position, part

☐ Order number at PRIHODA

☐ Identification by customer

☐ Material

☐ Treatment symbols

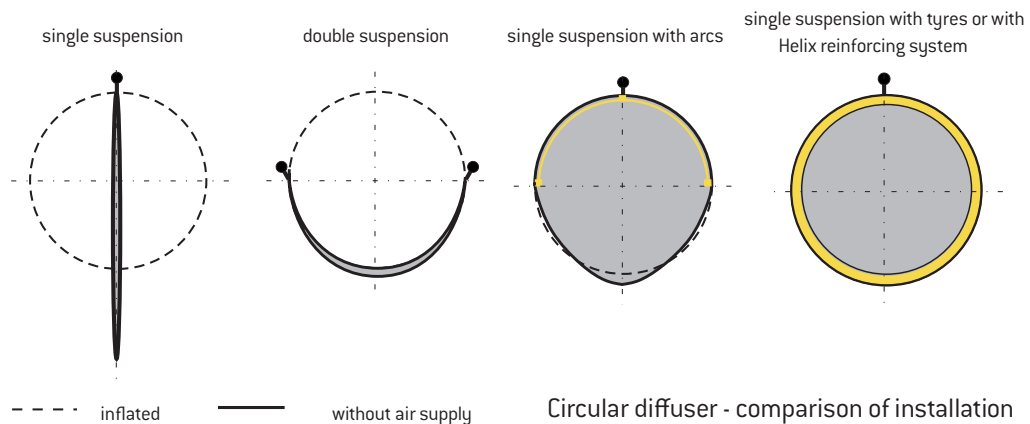
☐ Manufacturer

☐ Where and when it has been made

7.

Frequently Asked Questions

1. What does a Fabric Duct look like when the fan is switched off?



2. Is it possible to use Fabric Ducting for extract (exhaust air)?

PŘÍHODA s.r.o. were the first manufacturer worldwide to introduce negative pressure ducting onto the market. It is made with a square shape. The principal is based on sufficient stretching of all ducting walls by means of a tensioning system. The construction enables simple disassembly and re-installation. Laser cut perforations are used to allow the air into the duct.

3. What is the service-life duration of Prihoda Fabric Ducts?

This is not a short term solution. Diffusers made from good quality fabrics will last for fifteen years or longer. Light fabrics (PLS, NLS, approx. 100 g/m²) with maximum permitted number of 50 washing procedure or the cheap, (usually polyethylene Foils (NLF) susceptible to tearing) may have limited durability.

4. What is the pressure loss of a Fabric Duct?

In a well designed straight diffuser there is an almost constant static pressure throughout. The fabric perforation is calculated based on the average value of the static pressure. In other words, the diffuser is designed based on the external static pressure of the system. Shaped pieces (bends) and turbulence equalisers present certain pressure loss which needs to be taken into consideration. Loss caused by friction is usually minimal due to the decreasing air speed inside the diffuser. The minimum utilisable pressure is 50 Pa, however Light material (PLS, NLS) will inflate from 20 Pa.

5. Is it possible to use square or rectangular diffusers?

PŘÍHODA s.r.o. has developed a special construction which enables use of a quadrangular cross-section. The principal is based on stretching the fabric in transverse and longitudinal direction by means of a tensioning system. The construction enables simple disassembly and re-installation. Fabric ducting with quadrangular cross-section can be assembled directly on the ceiling or suspended in the area.

6. What do you do with diffusers when they get clogged by dust or other contamination?

All of our products are easy to clean. Most of our fabric allow washing in a washing machine. Diffusers with perforations (holes larger than 4mm) will never get completely clogged by contamination. Our diffusers with Micro-perforations have considerably longer (more than double) period of operation between maintenance cycles than permeable fabric. usually cleaning is only necessary due to hygiene or aesthetic reasons. Each part of our system separated by zippers has a unique washing label which identifies its position and any washing instructions.

7. Can Fabric Ducts get mouldy?

Mould can form on any kind of material if it is moist and unventilated. This goes also for most of our fabrics, including those with antibacterial finishing. Only one our fabric - Prihoda Plastic (NMF) - is mildew resistant. Never store moist diffusers and do not keep them out of operation for long periods of time, especially in moist atmosphere. Mould can cause indelible marks on the fabric.

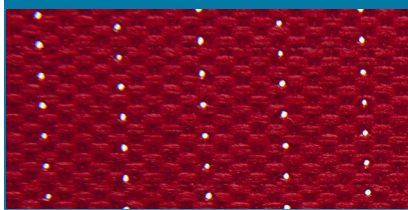
8. Does the Fabric Duct function as a filter at the same time?

If permeable materials (PMS, PMSre, PMI, PLS) are used, the fabric functions as a filter for the part of the transferred air that goes through the fabric. As the fabric contamination gradually increases, the pressure loss grows and the air flow decreases. Therefore, it is necessary to wash the fabric. We consider the utilisation of microperforated or laser cut perforated fabric to be by far the best solution. Although perforated fabrics do not function as filters they do not change the pressure loss value and the number of necessary washing procedures significantly drops. We are a manufacturer of distribution (not filtering) ducts and diffusers.

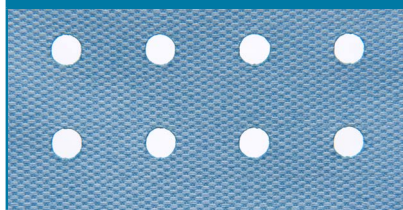
9. Why doesn't PRIHODA use plastic nozzles or slots?

Use of plastic nozzles or longitudinal slots were a historical necessity. These tools used to enable certain air distribution patterns, the nozzles in addition protected the frayed edges of the holes. When we began to use laser technology that allows cutting of accurate holes with sealed margins, they became redundant. Correctly designed rows of laser cut holes fulfil the same purpose, whilst being cheaper and more aesthetic. We use fabric nozzles for longest air flow and vertical outlet of air, never plastic nozzles. Our fabric nozzles are light weight and sonic welded to the material they will not fall out of the duct or damage the duct through friction during washing.

Mikroperforation



Perforation



Fabric nozzle



10. Why doesn't PRIHODA use more permeable fabrics?

We use permeable materials to avoid condensation where supply air temperature is below dew point. However, we only have material of a single permeability value. It is very low and serves just to prevent condensation. Distribution of air is done exclusively using holes (perforation or microperforation or a combination of both) and adjusted holes (nozzles, pockets). Our product portfolio also includes non permeable materials, which are often useful in other situations.

11. Which certificates do Prihoda fabric diffusers have

Our materials are certified with respect to fire resistance as per EN 13501-1 and EN 45545 (in various classes, based on the material) and as per the American UL. PŘÍHODA has a certified quality management system as per ISO 9001, a certified environmental management system as per ISO 14001 and an EPD environmental impact certificate. Příhoda textile diffusers have also received the Oeko-Tex certificate.

Oeko-Tex



ISO 9001



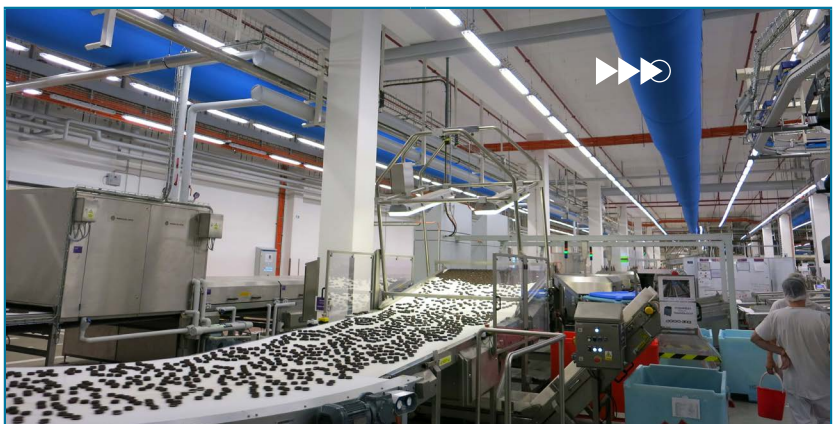
ISO 14001



8. Examples of Applications

Food processing industry

The first fabric diffusers were used in the food industry. Sanitary regulations require that all food processing devices should be easily sanitised and cleaned. Out of all the air distribution system options, this condition is only met by Fabric Ducting. Fabric Ducts are perfectly clean after washing and a disinfecting agent can also destroy any pathogens that may resist the antibacterial treatment. Fabrics made of endless fibres, developed especially for Prihoda's textile diffusers, are very smooth and do not allow the build up of impurities. This unique and special feature distinguishes them from diffusers made of staple fibres that continuously trap dust and can represent a sanitary risk.



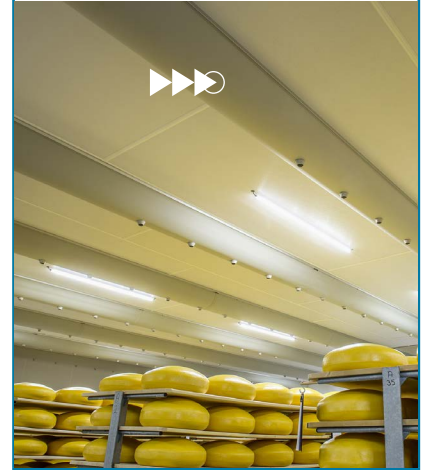
Supermarkets, exhibition and large retail areas



For large retail areas we can provide supply air through laser cut perforations or nozzles, whichever suits the application best. Experience over many years shows that Fabric ducting & diffusers offers a substantially better, more uniform air pattern than can be achieved with traditional systems, whilst also offering substantial cost savings. The wide range of 9 stock colours allows for many different aesthetic designs whilst the Fire Resistance of our fabrics meet all world wide standards.

Food Stores, Low Temperature Production Areas

In large cold stores Prihoda Fabric Ducting distribution systems provide uniform air distribution, ensuring maintenance of stable product temperatures and temperature zones. In production zones with large amounts of people working in low temperatures, high air velocity will be a major cause of discomfort and may cause a higher sickness or absence rate. Fabric ducts and diffusers disperse cold air without causing draughts, and create comfortable, low velocity environments for workers.



Industry

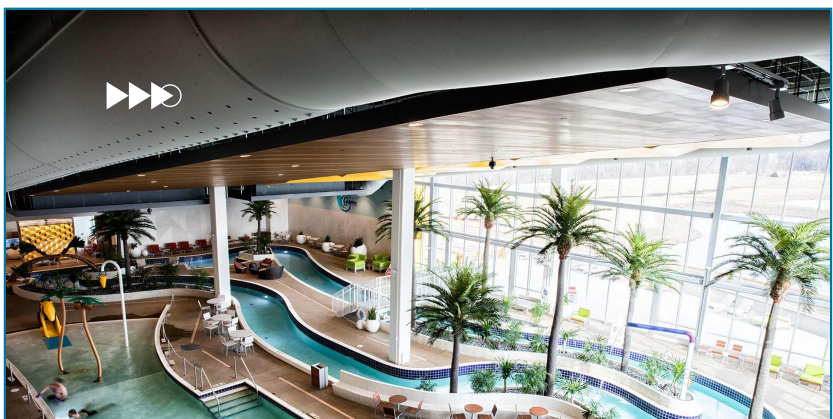
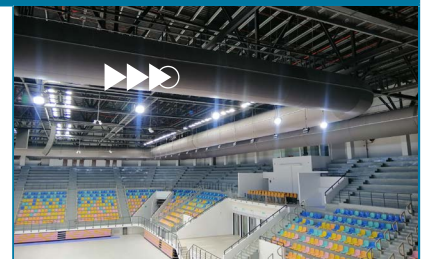


Prihoda Fabric Ducting air distribution is a perfect solution for any industrial operation. Prihoda Fabric Ducts provide uniform low velocity air distribution or targeted air patterns, at unbeatably low costs. Over 100 suspension solutions make it possible to choose a convenient installation style for any application, easily accommodating most suspended and formed ceiling types. Contaminated production environments may require the use of fabrics with larger laser cut perforations.



Pools, Sports Halls and Fitness Centres

Large sports facilities are a typical application for Prihoda Fabric Ducting & Diffusers, we are able to create a large range of diffusion air patterns to suit any project. Whilst our many installations at sports and fitness centres provide comfortable cooling air movement for customers 'working out'. In these applications low ceiling heights are often encountered, where half round fabric ducts make an aesthetic and functional low cost installation solution. Swimming Pools are a major user of Fabric Ducts, where the fabric material copes easily with the harsh environment at a fraction of the cost of treated and insulated rigid systems. The bright colours available revive and enhance many swimming pool interiors.

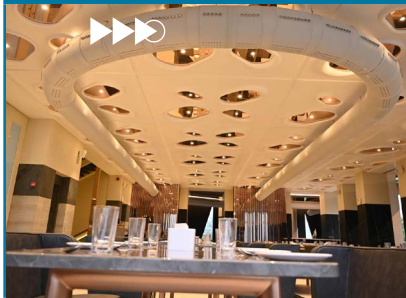


Kitchens

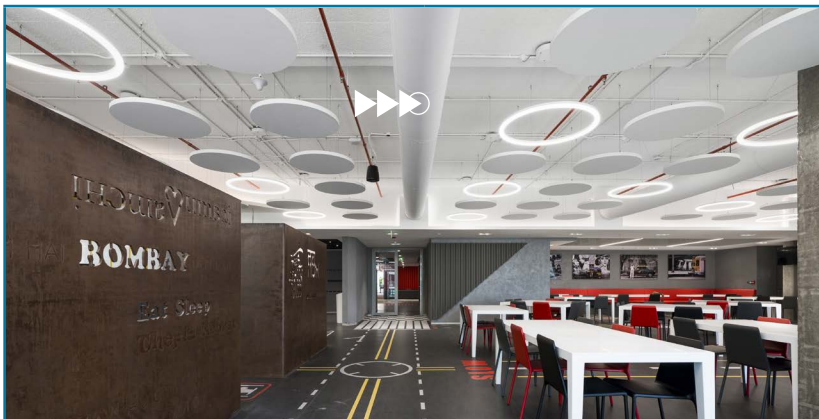
Space in kitchens is usually minimal, and their extreme load with heat and vapours requires intense ventilation. Prihoda Fabric Ducts disperse high volumes of air uniformly into this environment without creating draughts. The fabric material used is resistant to steams and vapours and maintenance is very quick and easy. Compared to a traditional stainless steel installation Fabric Ducting is a much lower purchase, installation and maintenance cost and easily achieves sanitary and hygiene demands due to its cleanability.



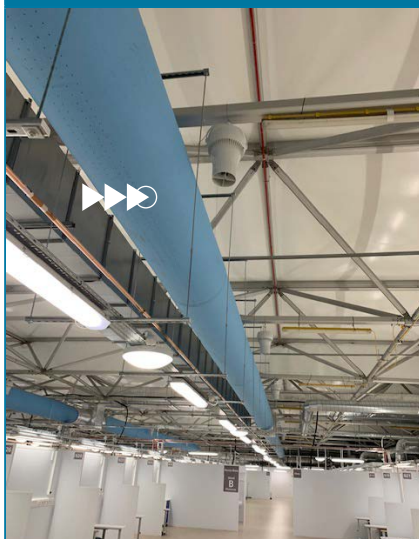
Offices, Restaurants, Cinemas etc.



Higher aesthetic demands can be satisfied by the multiple colour and shapes available with Prihoda Fabric Ducting air distribution. Correctly manufactured and perfectly installed fabric diffusers become an elegant part of an interior. Air diffusion through Fabric Ducting provides similar results to chilled beams or perforated ceilings, however although the performance is similar, Fabric Ducting is available at a much lower capital cost. Unlike the traditional diffusers, embedded in soffits, our broadly diffused solutions do not cause any local heat discomfort. Experience has demonstrated that employees in such equally distributed and cooled offices are significantly more comfortable.



Temporary Installations



The benefits of using Prihoda Fabric Ducting and distribution systems for cooling or heating of large scale tents or other temporary structures are self evident. Light weight roof structures can easily support fabric ducting and diffusers weighing from 100 to 400 g/m². Installation is very quick, using the supporting wires and hooks provided as part of the system. Top quality materials allow multiple repeated use. Cooling or heating using a large AHU and Fabric Ducting diffusing all along the structure, is much more economical than simply blowing the air into a space. Specifically with heating the warm air rises quickly creating a high temperature zone high in the ceiling and enormous heat loss. In cooling, with air diffused through Fabric Ducting intense airflow causes local air current and draughts; whilst elsewhere zones with insufficient cooling develop. Both cases are successfully resolved by a properly designed Fabric Ducting distribution system.

Tailor-made air ducting&diffusers

We are a medium-sized, Czech company that is fully specialised in producing textile ducting and diffusers designed for transporting or distributing air. We have production facilities in Czechia, China and Mexico. We don't make ducting by the metre, instead we provide a tailor made solution.



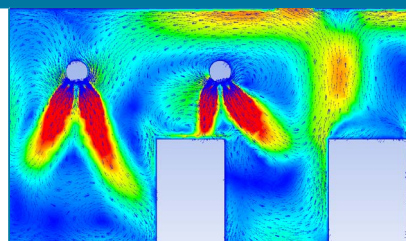
More intelligence in air distribution

Fabric ducting and diffusers provide a series of excellent technical benefits. These include draft-free air supply, even air-flow distribution, maximum induction or, conversely, low-speed air supply throughout. In addition, customers can choose any shape, size or colour scheme, including graphic motifs.



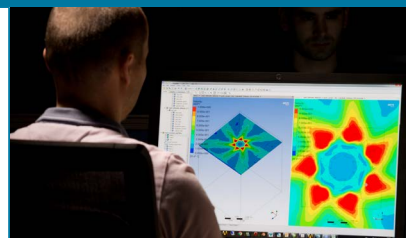
Customised solutions for every operation

We are able to simulate air flow in our customers' premises and suggest a suitable product. Our knowledge and years of experience allow us to put hundreds of technical details together so as to ensure the best result. Our expertise in air flow in pipes ducts and in space is what our work is all about.



The widest range of products thanks to innovation

In terms of fabric systems for the transport or distribution of air, there is practically no equipment or technical solution that we cannot manufacture. We have launched a range of completely new solutions and own several patents. We welcome comments from our customers, which we see as an opportunity to improve our services and perfect our products.



Contact us

Our products are supplied through a network of authorised, trained representatives who cover almost the entire world. To streamline communication with our customers we have developed our own Air Tailor software that enables orders to be specified precisely and down to the finest detail.



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