PŘÍHODA®

TAILOR-MADE AIR DISTRIBUTION

BASIC

TECHNICAL DATA

english version 2011

TEXTILE AIR DISTRIBUTION SYSTEMS
TEXTILE DUCTING

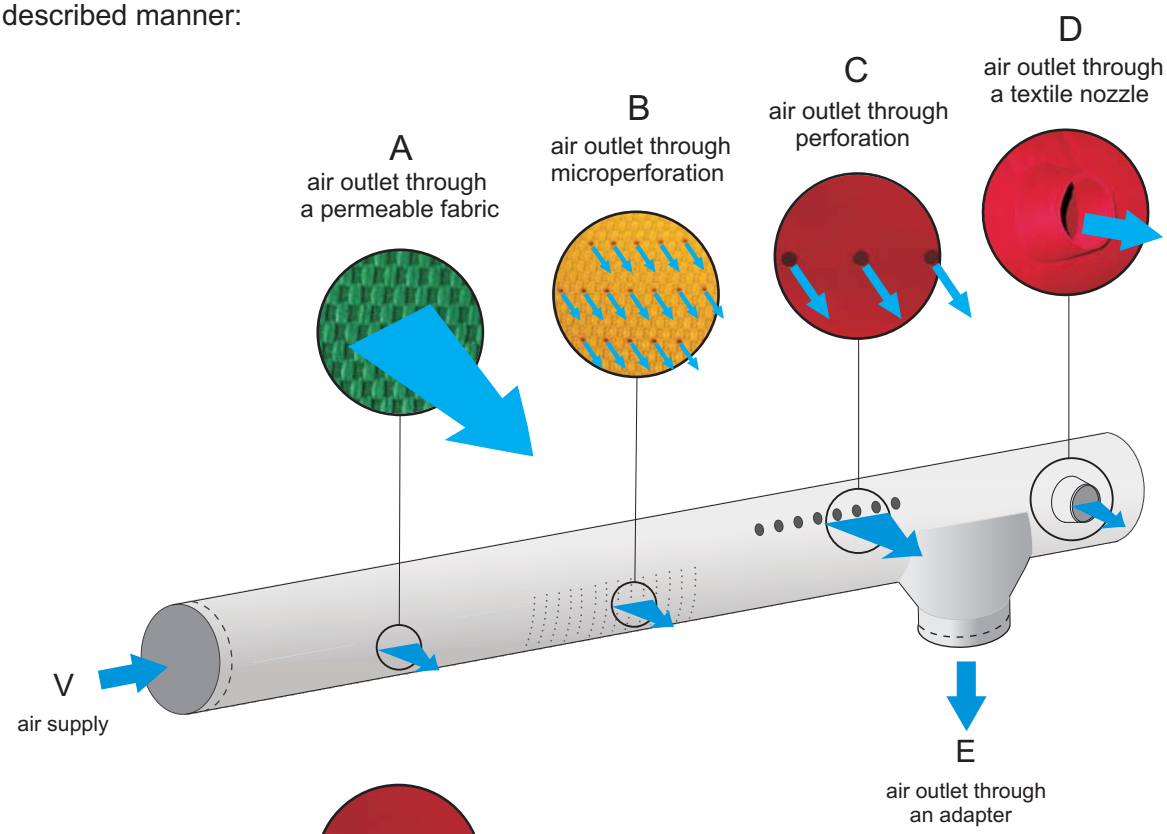
CONTENTS

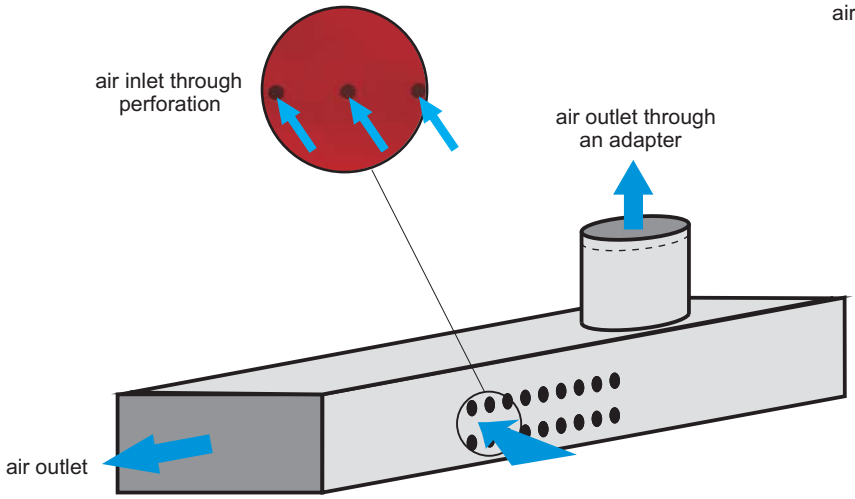
I. DIFFUSERS AND DUCTING

Our products are usually ducting and at the same time distribution or collection elements. We differentiate overpressure distributions (textile diffusers) designed for air distribution, and negative pressure ducting for air exhaust from the room.

II. AIR INLET AND OUTLET

Flow **V** brought into the diffuser through any of the ends or through the entry adapter exits in any of the below described manner:





Always $V = A + B + C + D + E$

Any of the values A, B, C, D, E can be zero

Perforation solely is used for the air inlet into the suction ducting.

III. AIR DISTRIBUTION METHOD

Air is distributed from the fabric diffuser through openings with various sizes. Combinations of sizes and layout of the openings together with various output velocities provide numerous variations. The scope of options begins with distribution of air at low speeds and continues up to targeted air supply for long distances.

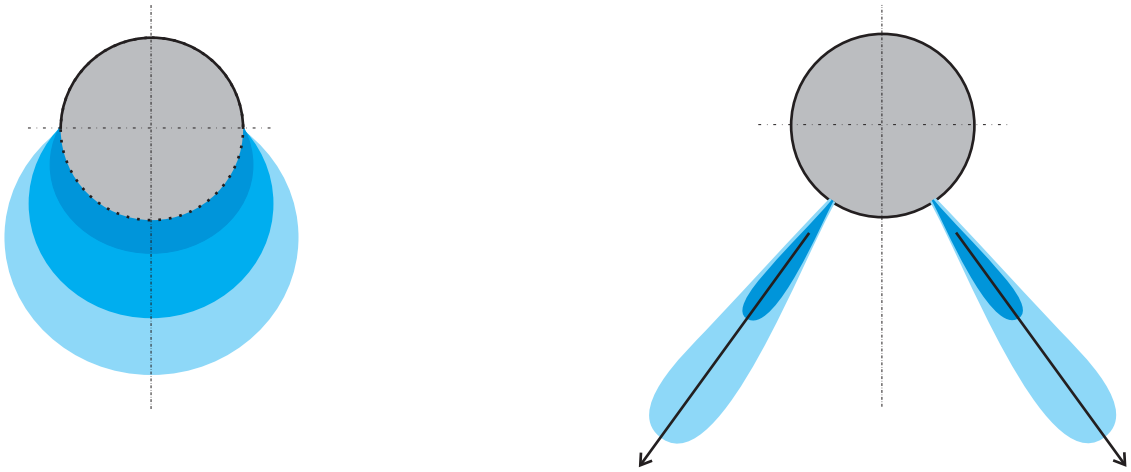
There are distinguished small holes with diameters 0.4 mm that are called microperforation are designed for dispersion of air. In case of targeted air supply there are used series of holes with diameters 4 mm or more that are called perforation. It is necessary to take into account effects of temperature differences when calculating flow velocity in a certain distance.

D (DIFFUSED)

DIFFUSED distribution of air using micro-perforation
Diffusers with micro-perforation dispersing air into their surroundings

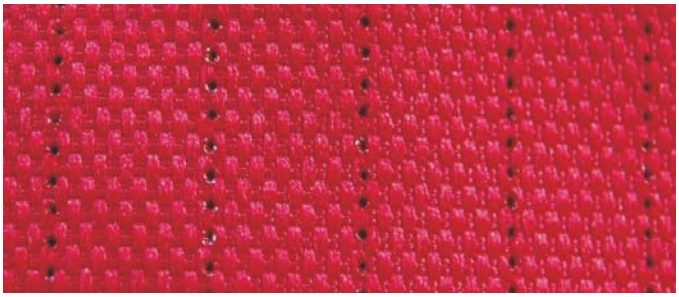
R (DIRECTIONAL)

DIRECTIONAL distribution of air using perforation
Diffusers with series of holes for longer reach of air flow



Examples of design

Speed of air-flow in various distances from the diffuser can be calculated by means of our software, which takes all the known effects (i.e. static pressure inside a diffuser, location and dimensions of inlets, and temperature differences) into account. We are ready to verify every your calculation. All our authorized dealers have the software at the disposal. Their addresses can be found on *www.prihoda.eu.*



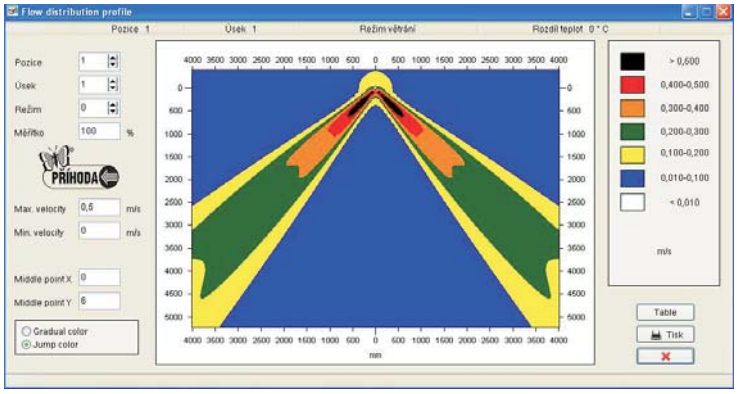
Detail of microperforation

Detail of perforation

IV. AIRFLOW REACH

Textile diffusers are an all purpose tool for air distribution. The textile nozzles have extended possibilities of air distribution by means of the textile diffusers. Nowadays we are covering the entire range of airflow reaches used at real applications.

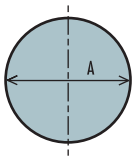
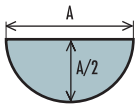
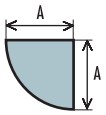
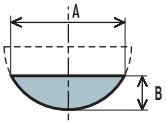
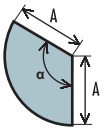
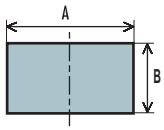
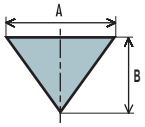
An example of airflow pattern created by the designing software of company Prihoda s.r.o.



* The airflow reaches vary in dependance on static pressure in the diffuser

V. SECTION AND SIZE

We distinguish seven different cross sections of the diffuser:

ONLY OVERPRESSURE	C	CIRCULAR		The basic version, easy maintenance, preferentially recommended.
	H	HALF - ROUND		Use where there is not enough space for circular diffuser and in exacting interiors.
	Q	QUARTER - ROUND		Use where there is not enough space for circular diffuser, in exacting interiors and if the diffuser is to be installed in a corner of a room.
	SG	SEGMENT		Use where there is not enough space even for a half-round diffuser.
	SC	SECTOR		Use where a quarter-round section cannot be used because of a nonstandard construction of a ceiling.
OVERPRESSURE AND NEGATIVE PRESSURE	S	SQUARE		The shape can be retained only by means of a special structure holding at least all the corners of the diffuser.
	T	TRIANGULAR		The diffuser cross section is maintained by stretching by means of a burden placed into the cross section bottom corner.

The shape partially deforms despite good stretching, due to overpressure or negative pressure and the material flexibility (applies to cross sections S and T).

The dimension is the diameter of the round and half-round shape, chord at round segments, and radius at quarter-round and circle section, edge length at square shape, base and height at the triangle shape.

Any size (100 mms at least) can be produced, according to a concrete demand. It does not apply to a connecting part, which is always by 10-15 mm bigger than the given value.In general, textile diffusers are used at similar flow speeds as the traditional ducting. The maximum useful speed is limited firstly by aerodynamic noise in relation to the place of use. Further limitations are represented by flow turbulences which might cause vibration of the fabric. Specific conditions of flow, static pressure and weight of the fabric used must be taken into account. Please contact us for correct dimension specification.

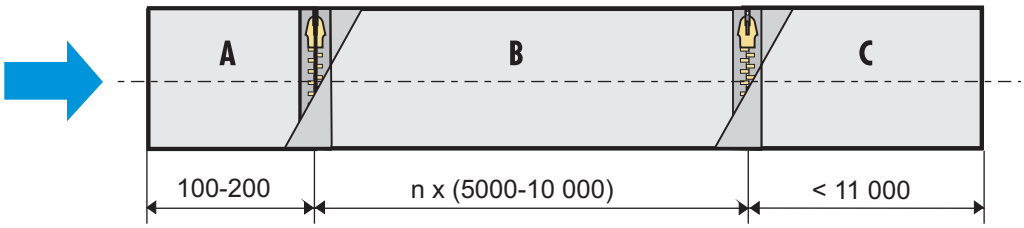
Basic series of A and B values:

100, 125, 160, 200, 250, 315, 400, 500, 630, 710, 800, 900, 1 000, 1 120, 1 250, 1 400, 1 600, 1800, 2000.

VI. LENGTH

The length of a diffuser depends mainly on the disposal of that particular place. Generally, constant air flow can be diffused by a diffuser from 1 to 200 meters long. The used material, its modification and the delivery pressure of the ventilator are the major factors.

THE MOST COMMON OCCURRENCE



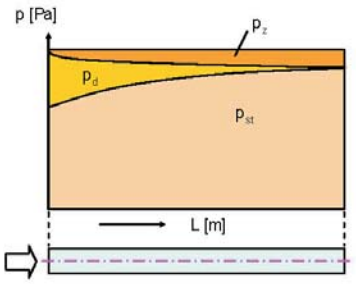
A = free beginning from 100 to 200 mm
B = through part from 5.000 to 10.000 mm
C = blind part arbitrary length from 1.000 to 11.000 mm
n = 0, 1, 2, … cca 40

The parts are linked up by zips. The number of the zippers can be adjusted acc. to the customers' demand. The total length of a diffuser (A + B + C) is to be indicated in a specification. The diffuser is divided into parts during manufacturing.
The allowance in length is ±1% when the diffusers are being produced.

VII. PRESSURE

The pressure losses of the textile distribution and ducting are similar to losses in common ducting. Also the calculation of a more complex textile air distribution system proceeds similarly as for a sheet metal duct. Minimum static pressure necessary to keep the correct shape of a textile diffuser depends on the weight of the fabric used. 20 Pa is sufficient for light materials and 50 Pa then for medium and heavy ones. The distribution of pressures along the diffuser differs from the traditional duct since the longitudinal speed drops. The easiest typical course case is shown in the below graph. Please contact us for correct design of the air distribution systems.

Graph of distribution of pressures in a textile diffuser



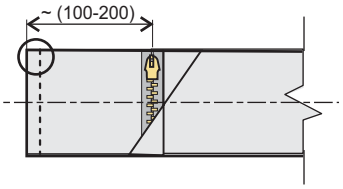


Samples of installation

VIII. TYPE OF ENDING

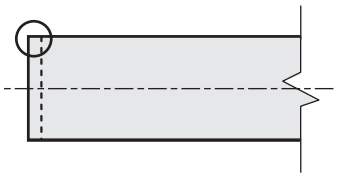
BEGINNING

F



HEMMING

H

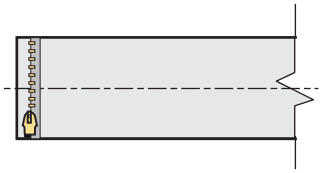


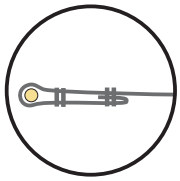
BLANKING

B

ZIP

Z

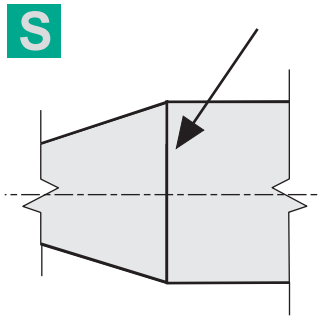


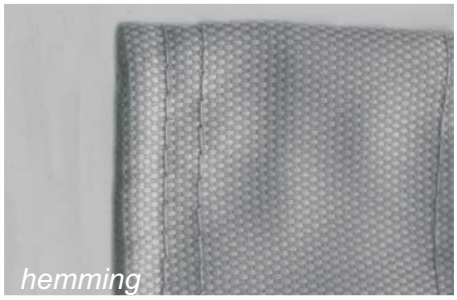


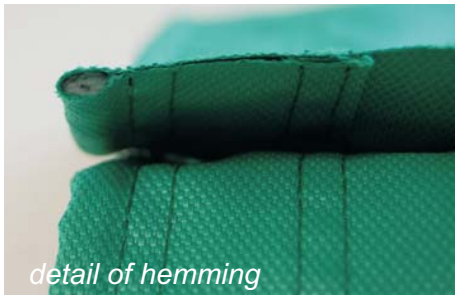
detail of hemming

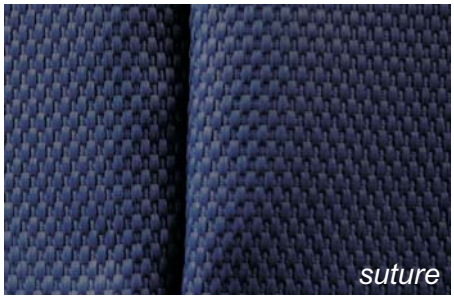
SUTURE

S





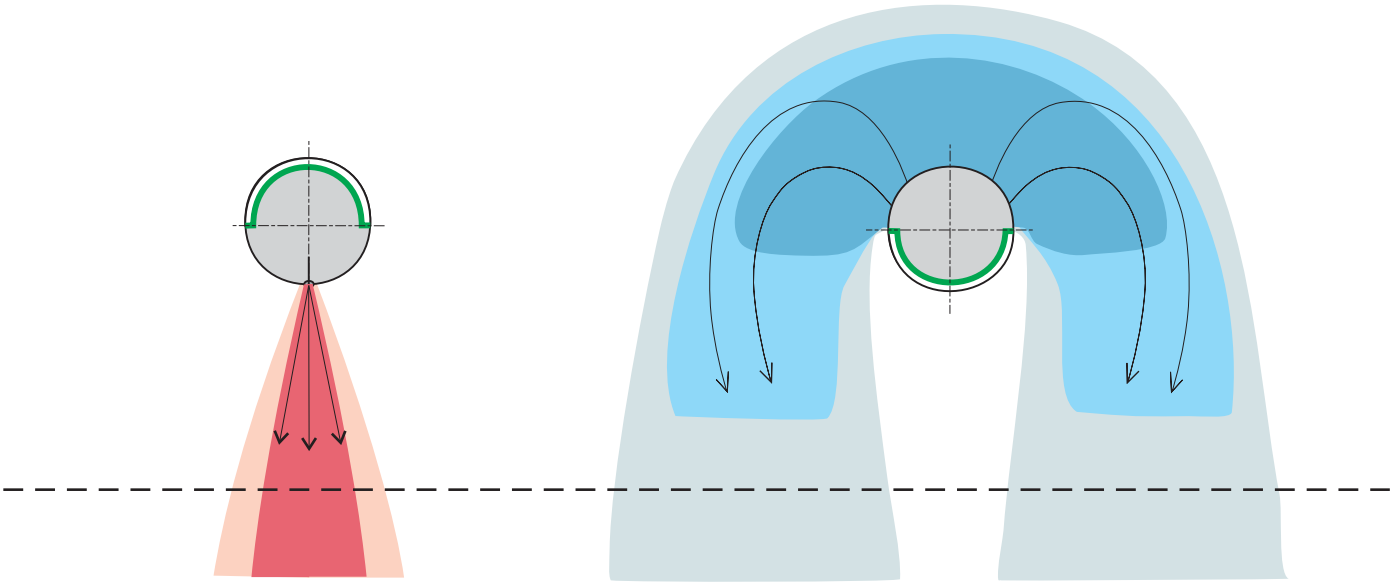




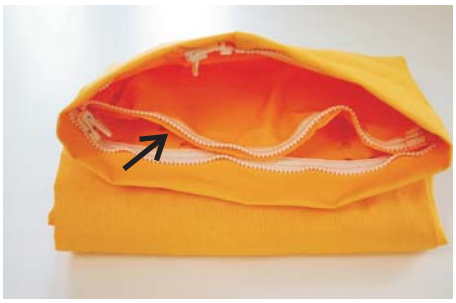
Type of ending details

IX. MEMBRANE DIFFUSER

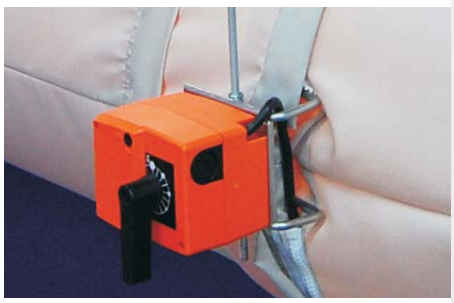
Two kinds of diffuser are combined in one product. A membrane, which is made of flimsy impermeable fabric, is sewed horizontally in the centre of a diffuser. The beginning of the membrane is attached to a flap controlled by a servomotor. It covers either the top or the bottom half of the diffuser. While heating, the membrane covers the top half of the diffuser and the air is diffusing through the row of openings downwards. The membrane covers the bottom half of the diffuser and the air is diffusing upwardly through permeable fabric / fabric modified by means of microperforation while air-cooling. The maximum allowed lengthwise air velocity in the membrane diffuser is 6,0 m/s. The membrane could be damaged at higher velocities.



heating *cooling*

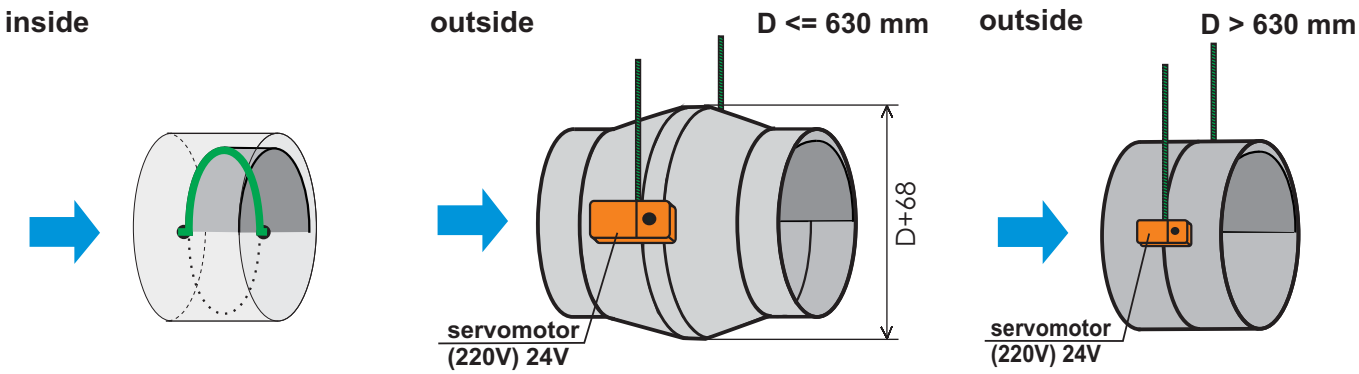


Detail of membrane diffuser



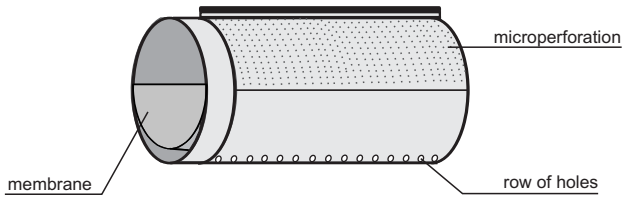
Flap and servomotor detail

THE FLAP: Is used to switch over between the two modes. The flap is made of PMS/NMS or PMI/NMI fabric (according to fire resistance), inner construction is made of galvanized steel. The length is always 400 mm.



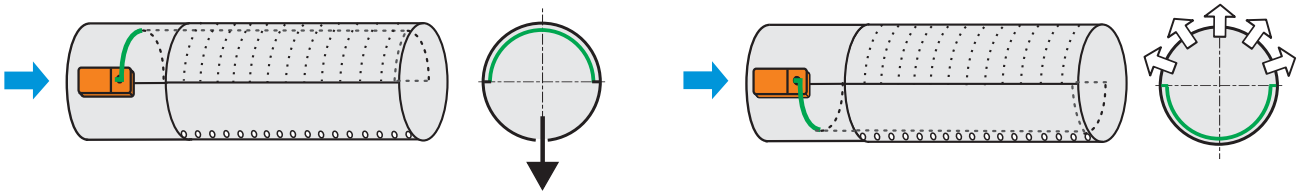
The flap D<=630 mm is hung in 1 point.

THE DIFFUSER: The membrane covers one half of the diffuser and uncovers the other one.



Heating position

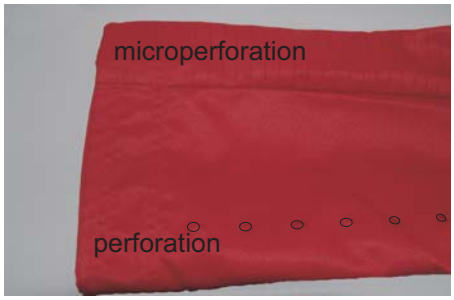
Cooling position



Servomotor 24V or 230V.

Installation of membrane diffuser

Detail of servomotor installation



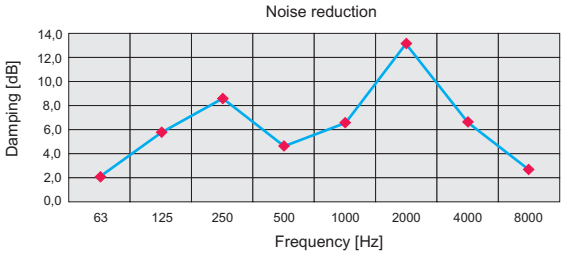
Detail of membrane diffuser

X. INSULATED DUCT

NOISE SILENCER + INSULATED DUCT

It is used for reduction of thermal losses with overcoming of non-air-conditioned sections between the machine room and the room being solved. As insulations there is used a 4 cm layer of non-woven polyester fabric that is sewn in between inner light-weight and outer usually medium-weight fabric. As outer layer there can be used any of our materials. Sewing together rather reduces thickness of insulation to approx. 20 - 30 mm. The achieved thermal resistance is 0,62 m^2.K/W. We deliver standardly 2 m pieces in all diameters including shaped pieces. One reinforcing plastic ring is installed each 2 m. The insulated duct reduces noise very effectively as documented in measurement of a 1 m long duct with diameter 500 mm.

Diagram of noise reduction in frequency bands with use of insulated ducts

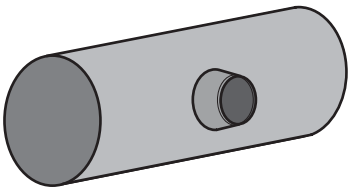


XI. TEXTILE NOZZLE

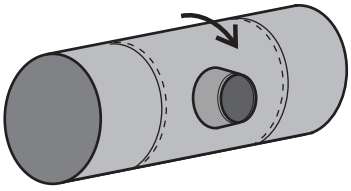
By means of the textile nozzle the transported air can reach longer distance than by means of the perforation.Depending on the static pressure and temperature difference the airflow reach can be even longer than 20 m.

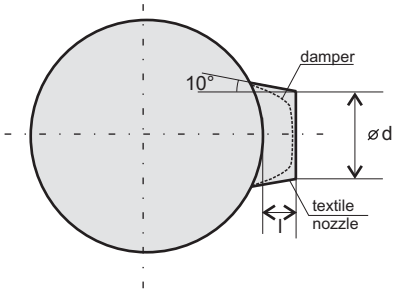
d min. = 80 mm d < 200 → l = 100 d > 200 → $l = \frac{d}{2}$

Textile nozzle



Turnable textile nozzle





Insulated duct

Cut of insulated duct

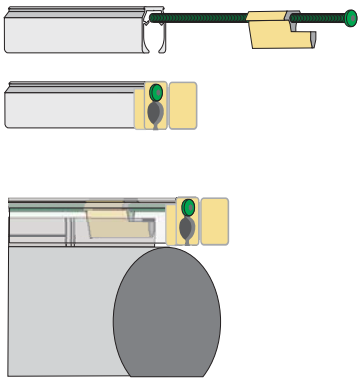
Textile nozzle

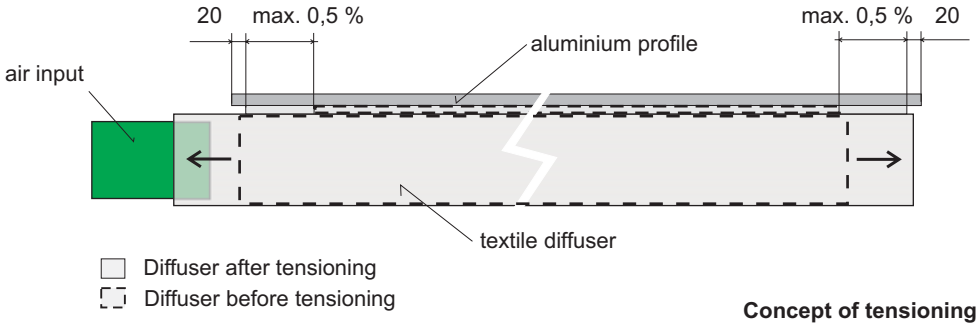
XII. TENSIONING SYSTEMS

The tensioners improve look of diffusers and we recommend using them every time.

SCREW TENSIONER IN THE PROFILE

An application of screw tensioner helps to smooth out both crumpled fabrics, wrinkles which have appeared due to packing and transportation and a small non-precision of sewing. Elasticity of fabric enables its tensioning attended by prolongation by max. 1%. For that reason installed unstrained diffuser is shorter than value given on the draft and the correct length is achieved by tensioner. These tensioners can be used for all the installation variants with aluminium profiles and enlarged strip or the shortest (32 mm) hooks. Installation procedure is described in mounting instructions.

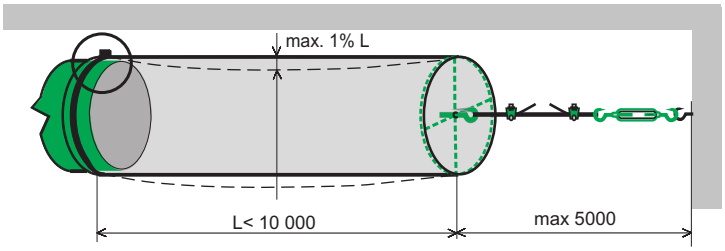




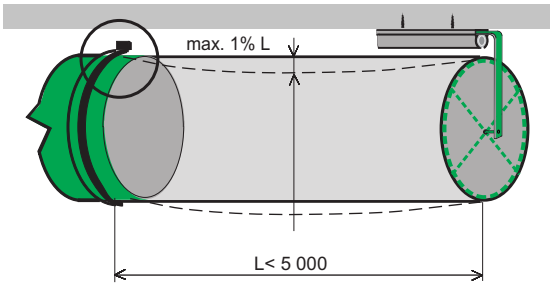
Concept of tensioning

TENSIONING SYSTEMS IN BLANKING

anchored into the wall in the axis of the diffuser

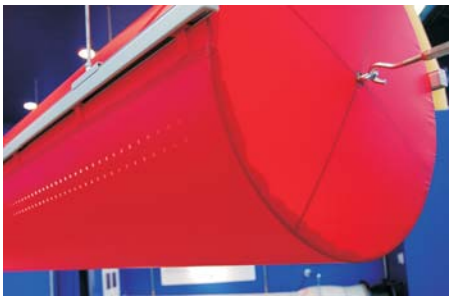


anchored into the profile on the ceiling (wall)



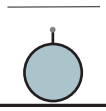
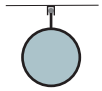
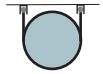
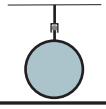
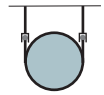
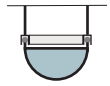
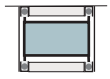
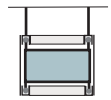
Screw tensioner in the profile

Use of tensioning system in blanking



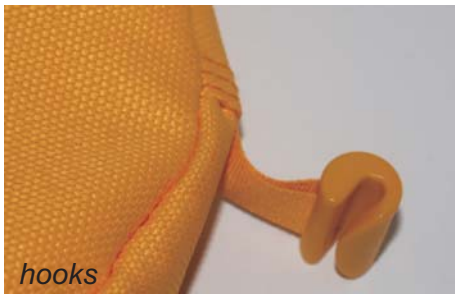
Detail of tensioning systems in blanking

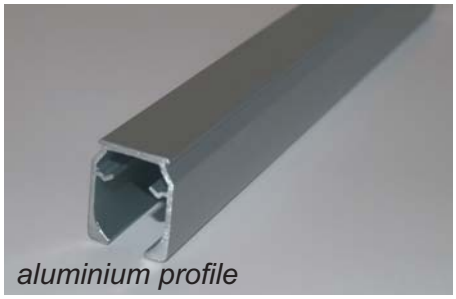
XIII. INSTALLATION

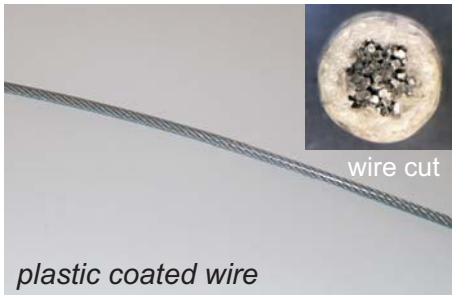
Installation number	Cross section scheme	Type of suspension	Additional accessories
0	without mounting material and hooks		
1		wire	D, F, K, M
2		wire	D, F, K, M
3		profile velcro	A, B, C, G, J, L, H
4		profile	B, C, G
5		suspension profile	A, B, C, G, I, D, E, F, K, L, M
6		suspension profile	A, B, C, G, I, D, E, F, K, L, M
7		tensioner can be added to any other installation	D, F, H
8		profiles velcro	A, B, C, G, L, H J (it is not valid for the triangular shape)
9		profiles	A, D, E, F, K, L, M
10		profiles	A, L
11		profiles	A, E, K, L, M

Example of installation

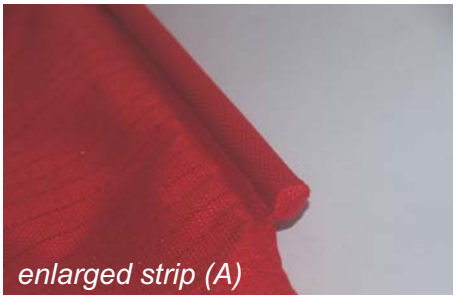
OVERVIEW OF ADDITIONAL ACCESSORIES		
	untagged	suspension by hooks and aluminium profile or by wire
	A	enlarged strip instead of hooks
	B	plastic profile
	C	aluminium profile with aluminium hangers
	D	stainless wire and stainless mounting material
	E	thread bar
	F	plastic coated wire and stainless mounting material
	G	stainless profile
	H	tensioner at blanking
	I	reinforced aluminium profile
	J	Velcro
	K	galvanized chain
	L	screw tensioner in the profile
	M	Gripple hangers

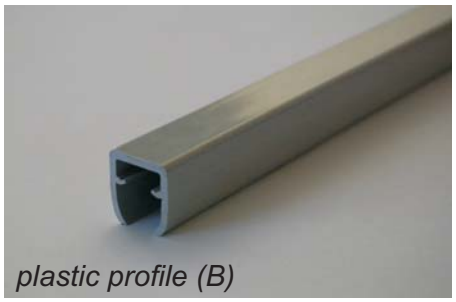

hooks


aluminium profile

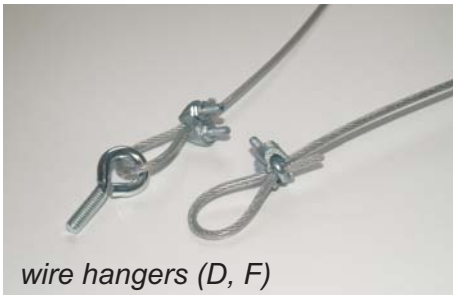


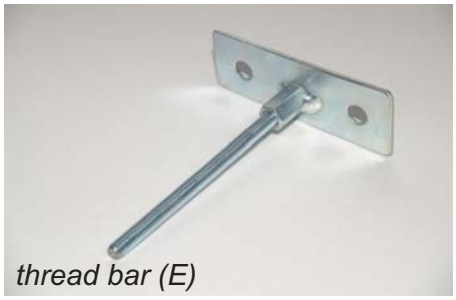
plastic coated wire

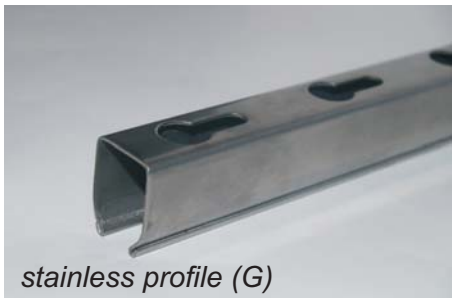

enlarged strip (A)


plastic profile (B)

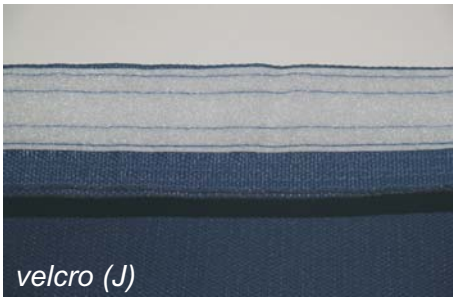

aluminium profile with hangers (C)


wire hangers (D, F)


thread bar (E)


stainless profile (G)


reinforced aluminium profile (I)


velcro (J)


types of Gripple hangers (M)

Details of additional accessories

XIV. OTHER EQUIPMENT

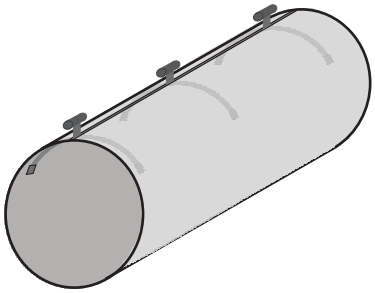
1. TYRES

They are used for maintaining the shape of the round diffuser even when it is not inflated. They are made from fireproof plastic materials (up to 400mm diameter), from stainless wire, or flat aluminium section. Standard distance between the tyres is 500 mm. They are fixed by Velcros in order to allow easy removing for maintanance.

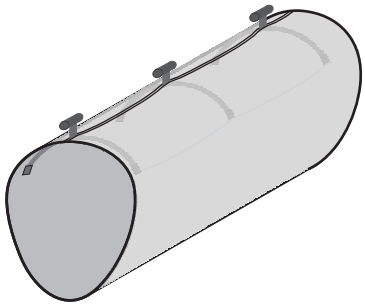
2. RACKS

They are used for maintaining the shape of the round diffuser even when it is not inflated. They are made from satin anodised aluminium and their use is displayed on the figures. They are attached to the sides in small pockets and at the top by means of Velcro so they are easy to remove and replace during maintenance. It is a cheaper alternative for reinforcing diffusers up to 2000 diameter.

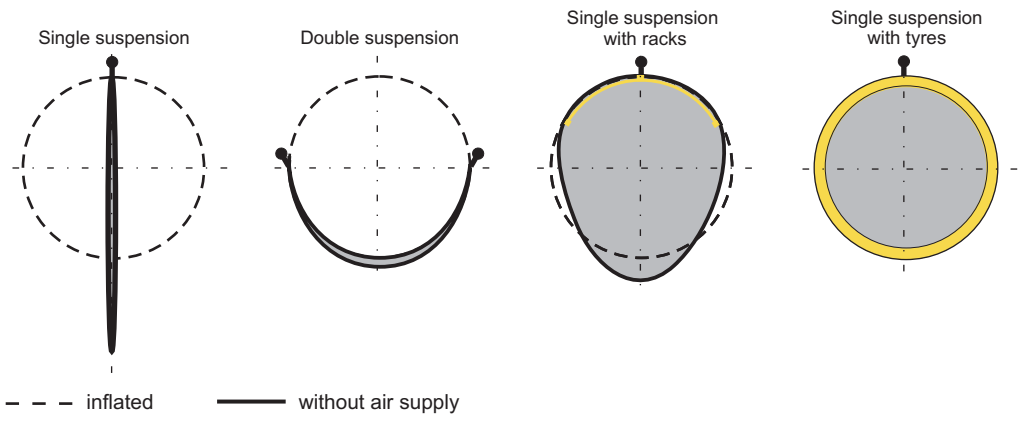
Diffuser with racks - inflated



Diffuser with racks - without air supply

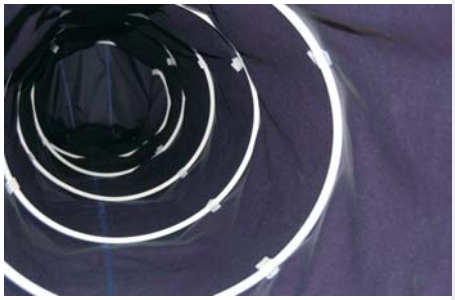


Circular diffuser - comparison of installations



Detail of rack

Diffuser with tyres without air supply

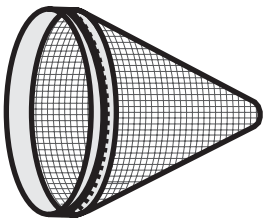


Detail of tyres inside of diffuser

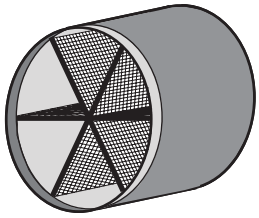
3. EQUALIZER

It is the device for modulation of turbulences in the airflow, mostly made from a sieve.

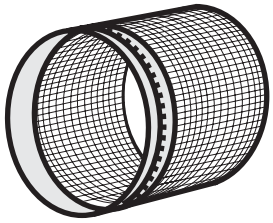
EQ
cone made of sieve



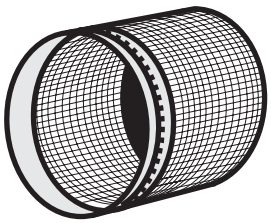
EQS **"star"**
"star" made of sieve sewn in a diffuser



EQC **"cylinder"**
sieve cylinder with a tyre, bottomless

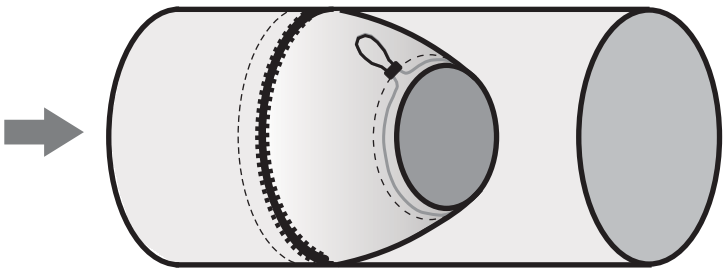


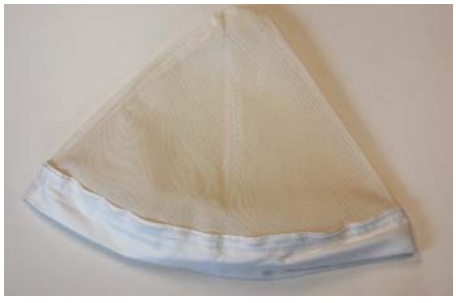
EQP **"pot"**
sieve cylinder with bottom



4. DAMPER

Damper is a blunt cone made of a permeable fabric. The lesser diameter of the cone is adjustable by means of a string with an arresting stop. A damper opened to its maximum equivalent to the diameter of the diffuser provides zero pressure loss. Complete tightness, on the other hand, provides the maximum local pressure loss. Having unfastened a neighbouring zipper you can modify adjustment of the damper easily.





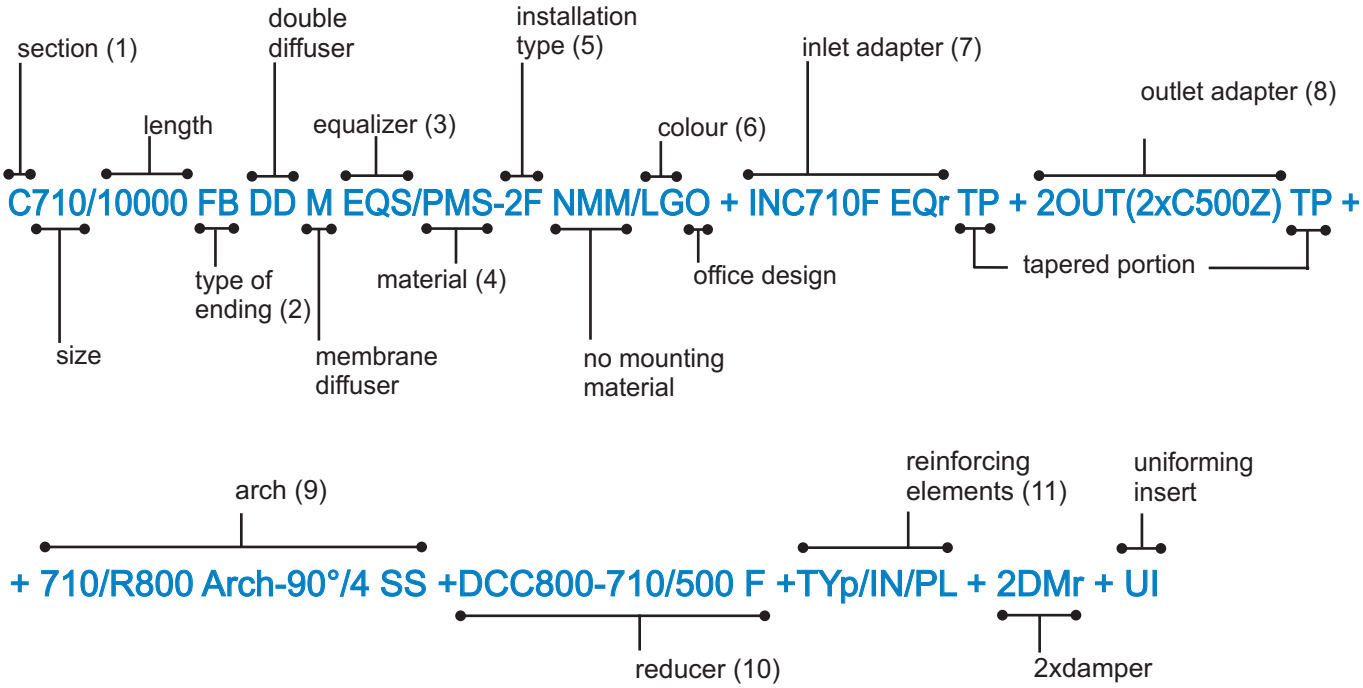
Detail of EQ

Detail of EQS

Detail of damper

XV. SPECIFICATION

Only simple diffusers can be described by a specification thoroughly. Specification is used as an approximate definition. It is not sufficient to place an order for a diffuser. A technical drawing or a detailed characterization are usually necessary.



1. **Section:** C - circular, H - half-round, Q - quarter-round, SC - segment, SG - sector, S - square
   XH - combined halfround , T - triangular

2. **Type of ending:** F - free beginning, Z - zip, H - hemming, S - suture, B - blanking

3. **Equalizer:** EQ - cone, EQS - star , EQC - cylinder, EQP - pot, r - removable

4. **Material:** Permeability: P - permeable, N - non-permeable
   Weight: M - medium, H - heavy, L - light
   Characteristic: S - standard, E - excellent fire resistance, I - increased fire resistance,
   B - antibacterial, F - foil

5. **Installation type:**

6. **Colour:** WH - white, BL - blue, LB - light blue, LG - light grey, YE - yelow, DG - dark grey, GR - green, RE - red,
   BC - black, SP - special, TR - translucent, GY - grey

7. **Inlet adapter:** C(section)710(size)F(type of ending) EQ(equalizer)

8. **Outlet adapter:** 2(number)C(section)500(size)Z(type of ending)

9. **Arch:** 710(size)/R800(radius) Arch-90°(angle)/4(number of segments) SS(type of ending)

10. **Reducer:** D(reducer)C(section)C(section)800(first size) -710(second size)/500(length)F(type of ending)

11. **Reinforcing elements:** TY - tyre, RA - racks, p - without tyres-only velcro, r - removable, IN/OUT,
    PL/ST/AL - plastic/stainless/aluminium

XVI. MAINTENANCE & WARRANTY

All our diffusers are made of high-quality resistant materials without natural fibres. The used material is specified during technical clearing of the order.

Diffusers made of PMS, PMI, PLS, PLI, NMS, NMI, NLI and NLS materials can be washed in a common industrial washing machine. NMF, NHE and NLF materials require hand washing. If a diffuser is equipped with tyres, braces or tensioning systems, then these fixed components need to be taken out before washing. Outer induction contamination can be usually removed by exhaustion using a vacuum cleaner and washing is thus not necessary.

The process of washing:

Strictly follow the maintenance symbols indicated on the labels sewn near the zips in the diffusers.

1. Wash the diffusers with common detergents (dosing according to the directions for use), the effect of washing is enhanced if the diffuser is turned inside out. We advise you to repeat the washing up to four times acc. to level of contamination, or to use more powerful washing powder. A special detergent (we will recommend one by request according to the particular dirt) should be used if the fabric is badly soiled.
2. Use a disinfectant only if it is essential according to the local service instructions. The chemical composition of the disinfectant must not harm the diffuser fabric (see maintenance symbols). Observe the producer`s dosing instructions.
3. Rinse the diffusers in clean water.
4. Spin-dry the diffusers gently, install them and finish drying by the air flow from the ventilator.

Symbols key:

	max. temperature for washing 40°C normal mechanical action normal rinsing normal separating
	gentle washing in a washing machine, maximum temperature 40 °C, gentle mechanical action, rinsing in water cooling down, gentle spin-drying
	washing only by hands product must not be washed in washing machine max. temperature 40°C cautious handling
	product must not be whitened with detergents disengaged chlorine
	dry in a drum-drying machine use lower temperature of drying
	product can't be dryed in a drum-drying
	ironing within of max. temperature of ironing surface 110°C, cautious with steam ironing
	product must not be ironned steaming is inadmissible
	product must not be dry cleaned the stains must not be removed by organic solvents
	product can be dry cleaned with tetrachlorethen, monofluortrichlormethan and all solvents mentioned with symbol F usual cleaning progresses are without any limits

A claim for repairs of the goods under warranty expires if the mounting and maintaining instuctions supplied with the goods have not been followed. And furthermore, every diffusers has sewn in washing labels specifying basic maintenance instructions valid for that particular fabric. A diffuser teared forcibly cannot be a subject of a complaint. Splitting of seams and tearing of the fabric or hanging items caused by overpressure or surge of air-flow can be subjects of a complaint only if in operation, the real parameters (flow and overpressure) are equal to those calculated.

Material	Warranty period
PMS, NMS, PMI, NMI	10 years
PLS, NLS, PLI, NLI, NMF, NHE	2 years
NLF, atypical fabrics, other equipment, installation with Velcro, mounting material and other parts of diffusers	1 year

XVII. MATERIAL LIST

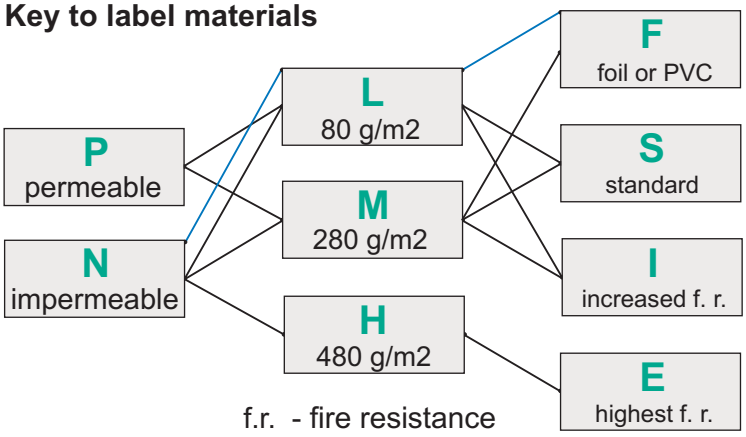
Textile materials

The material used is essential for correct function of the diffusers that meets requirements of technical regulations and provides sufficiently long service life. Our products are manufactured only of synthetic materials and their basic overview can be found in the following table.

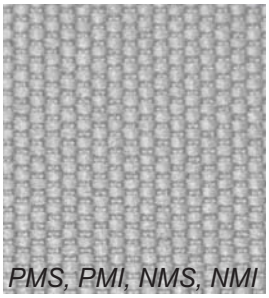
Designation	Permeability	Weight	Material	Characteristic						
				antibacterial	fire resistance	high strength	washing in washing machine	clean rooms	number of standard colours	special colours
PMS/NMS	yes/no	medium	100% polyester	◐	○	●	●	●	9	◐
PMI/NMI	yes/no	medium	100% polyester modified	●	●	●	●	●	9	◐
PLS/NLS	yes/no	light	100% polyester	◐	○	○	●	●	9	◐
PLI/NLI	yes/no	light	100% polyester modified	◐	●	○	●	●	9	◐
NLF	no	light	100% polyethylene	○	○	○	○	○	2	○
NMF	no	medium	100% polyester + 2x PVC + Sb2O3	○	●	○	○	○	4	○
NHE	no	heavy	100% fibre glass + 2x polyurethane	○	●	○	○	○	7	○

● always ◐ upon request ○ impossible

Key to label materials

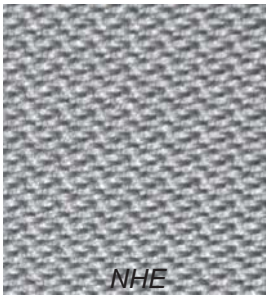


f.r. - fire resistance


PMS, PMI, NMS, NMI


PLS, PLI, NLS, NLI


NMF


NHE


NLF

Structure of fabrics

Colours: The following colours are being supplied

WH white
~RAL 9016

YE yellow
PANTONE 135
~RAL 1017

LB light blue
PANTONE 2915
~RAL 5012

LG light grey
PANTONE 420
~RAL 7035

GR green
PANTONE 341
~RAL 6024

BL blue
PANTONE 7462
~RAL 5005

DG dark grey
PANTONE 424
~RAL 7037

RE red
PANTONE 187
~RAL 3001

BC black
PANTONE 419
~RAL 9017

For exact colour shades, please, see our shadecard for that particular type of fabric, which can be ordered at sales@*prihoda.eu.* Special colours, which are not listed above, consult with our authorized representatives.