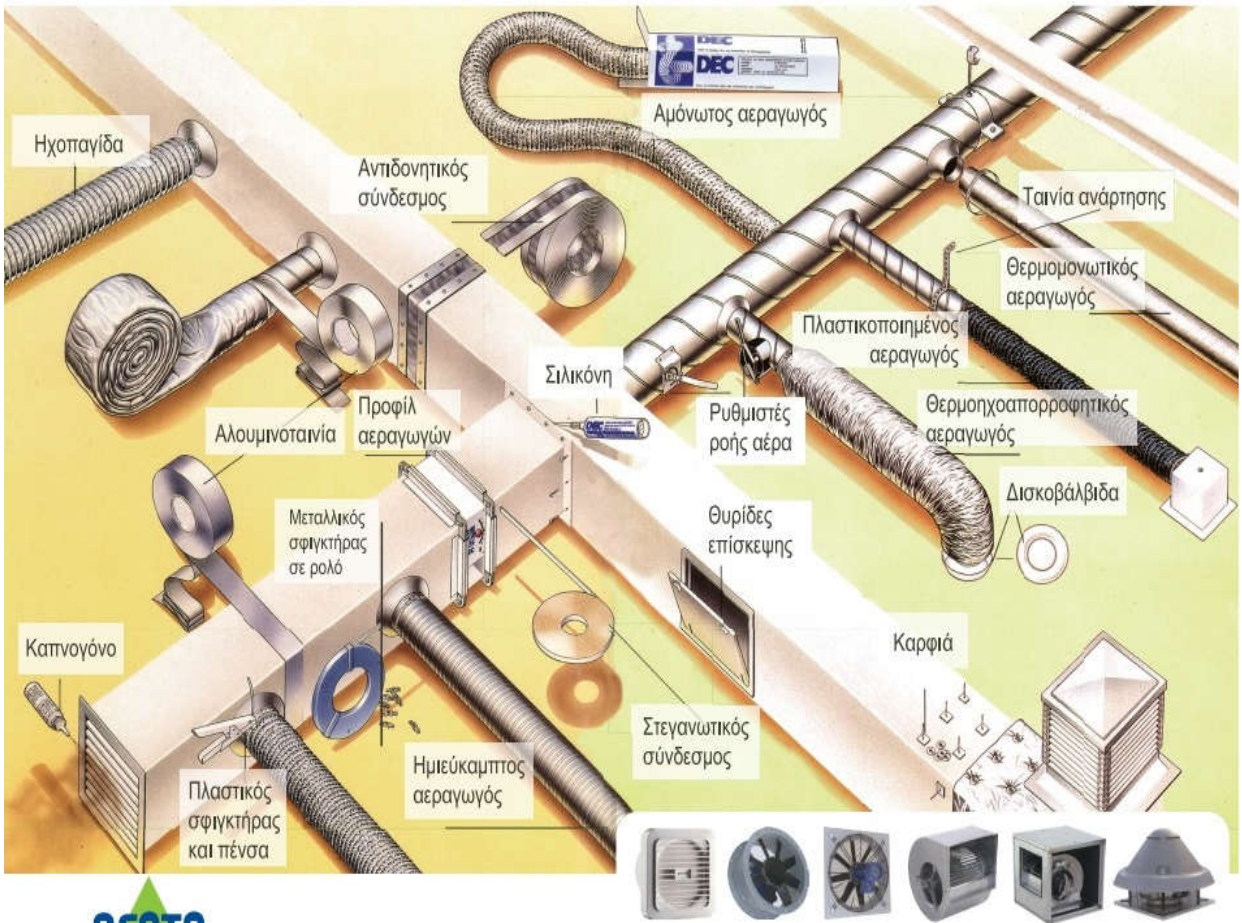
DEC INTERNATIONAL
WORLD LEADER IN FLEXIBLE DUCTING
MEMBER OF THE DEC GROUP

ΤΕΧΝΙΚΟΣ ΚΑΤΑΛΟΓΟΣ ΠΡΟΪΟΝΤΩΝ



Ανεμιστήρες για επαγγελματικούς χώρους και κατοικίες όλων των τύπων.
Αξονικοί, φυγοκεντρικοί και σε κιβώτιο, οροφής, καμινάδας.

ΔΕΛΤΑ ΤΕΧΝΙΚΗ ΟΜΙΛΟΣ ΕΤΑΙΡΕΙΩΝ

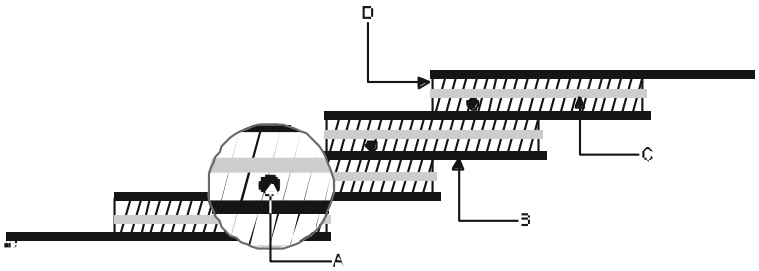
Λεωφ.Ποσειδώνος 51 • 183 44 • Μοσχάτο • Τηλ. 210 94 00 720 • Fax 210 94 03 782 • info@deltatechniki.gr • www.deltatechniki.gr

1.000 General Information Flexible ducting

DEC INTERNATIONAL®'S SPECIAL DUCT CONSTRUCTIONS

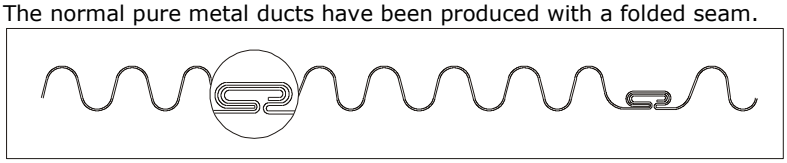
Dutch Environment Corporation®BV trading under the name **DEC International®** is in the forefront of its field, with a range of special ducts developed by the department, responsible for laminate ducts and pure metal ducts. The composition of these two constructions is explained below.

The **DEC**-laminate has been constructed out of a "sandwich construction".
The polyester layer and the aluminium foil are shifted with respect to each other.



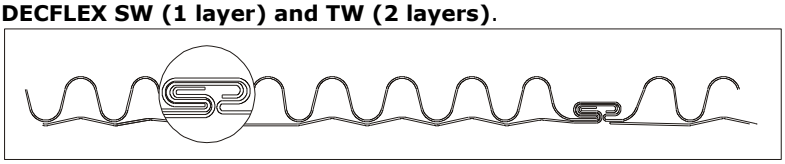
A. wire
B .polyesterlayer
C. aluminium foil
D. adhesion

PURE METAL DUCTS
The normal pure metal ducts have been produced with a folded seam.



DEC International®, however, has produced a few products more solid.
This means that these connections have a double folded seam.
This connection is used in products like the **Flueliners.**

DECFLEX SW (1 layer) and TW (2 layers).



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1.000 General Information Flexible ducting

OPTIONS IN RESPECT TO HOUSE CONSTRUCTION

Application	Product	Properties	P-series
Mechanical exhausting	◗ Aludec® ◗ Combidec® ◗ Greydec®	◗ up to 250 °C ◗ up to 140 °C ◗ up to 70 °C different chem. resistant	▪ 1.1 ▪ 1.2 ▪ 1.3
Air heating	◗ Isodec® ◗ Sonodec®	◗ T insulated ◗ T + A insulated	◗ 1.6 ◗ 1.7
Toilet exhausting	◗ Aludec® ◗ Greydec®	▪ up to 250 °C ▪ up to 70 °C	◗ 1.1 ◗ 1.3
Mechanical ventilation	◗ Aludec® ◗ Combidec®	◗ very flexible ◗ very flexible	◗ 1.1 ◗ 1.2
Removing noise machines	◗ Sonodec®	◗ fire resistance tested	◗ 1.7
Combustion tube	◗ Decflex Flueliner	◗ smooth inside	◗ 1.5
Chimney lining	◗ Decflex Flueliner	◗ combustion gas resist. ◗ air supply	◗ 1.5 ◗ 1.5
Insertion loss	◗ Sonodec® TRD	◗ attenuation in flow direction	◗ 1.7
Sound attenuation duct wall	◗ Sonodec® GLX	◗ increased attenuation duct wall	◗ 1.7
Insulation of existing channels	◗ Isosleeve	◗ insulation jacket to attach easily	◗ 1.6

OPTIONS IN RESPECT TO BUILDING OF PUBLIC UTILITIES

Application	Product	Properties	P-series
Cooled air	◗ Isodec® ◗ Sonodec®	◗ T insulated ◗ T+A insulated	◗ 1.6 ◗ 1.7
Mechanical exhausting	◗ Aludec® ◗ Combidec® ◗ Greydec®	◗ up to 250 °C ◗ up to 140 °C ◗ up to 70 °C ◗ diff.chem.res.	◗ 1.1 ◗ 1.2 ◗ 1.3
Air heating	◗ Isodec® ◗ Sonodec®	◗ T insulated ◗ T+A insulated	◗ 1.6 ◗ 1.7
Toilet exhausting	◗ Aludec® ◗ Combidec® ◗ Greydec® ◗ Stretchdec® ◗ Compacdec®	◗ up to 250 °C, flexible ◗ up to 140 °C, flexible ◗ up to 70 °C, flexible ◗ up to 250 °C, rigid ◗ up to 250 °C, rigid	◗ 1.1 ◗ 1.2 ◗ 1.3 ◗ 1.4
Mechanical ventilation	◗ Aludec® ◗ Combidec® ◗ Stretchdec® ◗ Compacdec®	◗ aluminium laminate ◗ mechan. strengthened ◗ pure aluminium ◗ pure aluminium	◗ 1.1 ◗ 1.2 ◗ 1.4
Removing noise machines	◗ Sonodec®	◗ fire resistance tested	◗ 1.7
Exhaust- and ventilation duct	◗ Combidec® ◗ Greydec® HP	◗ up to 140 °C ◗ up to 70 °C ▪ diff. chem. res.	◗ 1.2 ◗ 1.3
Chimney lining	◗ Decflex Flueliner	◗ combustion gas resistant ◗ air supply purposes	◗ 1.5 ◗ 1.5
Decreasing of sound level	◗ Sonodec® TRD	◗ increased attenuation in flow direction	◗ 1.7
Decreasing of noise	◗ Sonodec® GLX	◗ increased wall attenuation	◗ 1.7
Insulation of existing channels	◗ Isosleeve	◗ insulation jacket to attach easily	◗ 1.6

EXPLANATION

p-series = Product sheet series
al = Aluminium
T insulated = Thermically insulated
T+A insulated = Thermically and Acoustically insulated
diff. chem. res. = Different chemical resistents

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OPTIONS IN RESPECT TO INDUSTRY AND GENERAL

Application	Product	Properties	P-series
Exhaust hose	◗ Decflex Flueliner	◗ smooth inside	◗ 1.5
Exhausting welding vapours	◗ Combidec®	◗ static set up	◗ 1.2
Insulation (rain) water discharging	◗ Isosleeve	◗ to attach easily	◗ 1.6
Air supply general	◗ Aludec® ◗ Compacdec® ◗ Stretchdec®	◗ aluminium laminate ◗ pure aluminium ◗ pure aluminium	◗ 1.1 ◗ 1.4
Air supply higher temperatures	◗ Aludec® 112	◗ up to 250 °C	◗ 1.1
Higher temperature resistance	◗ Decflex Flueliner	◗ smooth inside surface	◗ 1.5
Chimney lining	◗ Decflex Flueliner	◗ combustion gas resist. ◗ ventilation	◗ 1.5 ◗ 1.5
Decreasing of sound	◗ Sonodec® TRD	◗ increased attenuation in flow direction	◗ 1.7
Decreasing of sound	◗ Sonodec® GLX	◗ increased attenuation in duct wall	◗ 1.7
Insulation of existing channels	◗ Isosleeve	◗ insulation jacket to attach easily	◗ 1.6

OPTIONS IN RESPECT TO SPECIAL APPLICATIONS

Application	Product	Properties	P-series
Clothes drier	◗ PVC	◗ up to 70 °C	◗ 1.3
General air supply purposes	◗ Aludec®	◗ very flexible	◗ 1.1
Chimney lining	◗ Decflex Flueliner	◗ combustion gas resist. ◗ ventilation	◗ 1.5 ◗ 1.5
Decreasing of sound	◗ Sonodec® TRD	◗ increased attenuation in flow direction	◗ 1.7
Decreasing of sound	◗ Sonodec® GLX	◗ increased attenuation of the duct wall	◗ 1.7

EXPLANATION

P-series = Product sheet series
Al = Aluminium
T insulated = Thermically insulated
T+A insulated = Thermically and acoustically insulated
diff. chem. res. = Different chemical resistents

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1.010 ALUDEC® Laminated ducting

ALUDEC® ducts are flexible, strong laminate ducts for various purposes. The ducts consist of several layers of aluminium and polyester, with a spiral enclosed between the layer. The duct can be attached to round and oval connection parts without any problems. The fire resistance of the **ALUDEC®** ducts has been tested in several countries, according to current international standards.
Because of the "sandwich construction" , the different layers of polyester and aluminium are overlapping each other completely. In case of fire, the system is able to function longer.

Determination of the acute toxicity
Stated by the "Institut für Arbeitsmedizin" of the medical faculty of the technical university of Aken.
Under the supervision of prof. dr. med. H.J. Einbrodt (specialist) classified as "non toxic".

Applications in practice

ALUDEC® AA3 & ALUDEC® 245
- General air supply systems, without special demands
- Air conditioning systems, without special demands

ALUDEC® 112 & CE-Flex®
- Air supply systems, where a higher temperature resistance is required
- Air conditioning systems, where a higher temperature resistance is required

	ALUDEC® AA3	ALUDEC® 245	ALUDEC® 112	CE-FLEX®
Mechanical properties				
Temperature range (°C)	-30 - +140	-30 - +140	-30 - +250	-30 - +250
Maximum operating pressure (Pa)	2500	2500	3000	3000
Maximum air velocity (m/s)	30	30	30	30
Diameter range (mm)	102 - 508	82 - 508	76 - 710	102 - 508
Fire class according to				
Europe (EN 13501-1)	B-s1, d0	B-s1, d0	A2-s1, d0	x
The Netherlands (NEN 6065/6066)	1	1	1	x
Germany (DIN 4102)	B2	B2	B1	x
France (CSTB)	M1	M1	M0	M0
Switzerland (BKZ)	x	x	6Q3	x
United Kingdom (BS 476)	6, 7 and 20	6, 7 and 20	6, 7 and 20	x
Austria (B3800)	B1	B1	B1	x
Italy (CSI)	1	1	1	x
Technical data				
Article code	DA3{Ø}	DA245{Ø}	DA112{Ø}	DACEM0{Ø}
Material structure	5 layer	5 layer	4 layer	4 layer
Wire spacing -Upto ø102 mm -ø102 mm and larger	- 36 mm	25 mm 18 mm	25 mm 18 mm	- 36 mm
Minimum bending radius	0.54 x Ø	0.58 x Ø	0.58 x Ø	0.54 x Ø
Standard length (metres)	10	10	10	10
Standard colour	aluminum	aluminum	aluminum	aluminum

The **ALUDEC®** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **ALUDEC®** ducts are not suitable for discharging combustion products from open fireplaces and oil-fired boilers. Neither are the **ALUDEC®** ducts suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product. The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.011 ALUDEC® 270 Laminated ducting

ALUDEC® ducts are flexible, strong laminate ducts for various purposes. The ducts consist of several layers of aluminium and polyester, with a spiral enclosed between the layers. The duct can be attached to round and oval connection parts without any problems. The fire resistance of the **ALUDEC®** ducts has been tested in several countries, according to current international standards.
Because of the "sandwich construction", the different layers of polyester and aluminium are overlapping each other completely. In case of fire, the system is able to function longer.

Determination of the acute toxicity
Stated by the "Institut für Arbeitsmedizin" of the medical faculty of the technical university of Aken.
Under the supervision of prof. dr. med. H.J. Einbrodt (specialist) classified as "non toxic".

Applications in practice

ALUDEC® 270
- General air supply systems, without special demands
- Air conditioning systems, without special demands

	ALUDEC® 270
Mechanical properties	
Temperature range (°C)	-30 - +140
Maximum operating pressure (Pa)	2500
Maximum air velocity (m/s)	30
Diameter range (mm)	82 - 508
Technical data	
Article code	DA270{Ø}
Material structure	5 layer (2Poly/3Alu)
Wire spacing -Up to ø102 mm -ø102 mm and larger	25 mm 18 mm
Minimum bending radius	0.58 x Ø
Standard length (metres)	10
Standard colour	aluminium

The **ALUDEC®** fulfils all the requirements and is classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **ALUDEC®** ducts are not suitable for discharging combustion products from open fireplaces and oil-fired boilers.
Neither are the **ALUDEC®** ducts suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
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1.012 ALUDEC® FAAF Laminated ducting

ALUDEC® ducts are flexible, strong laminate ducts for various purposes. The ducts consist of several layers of aluminium and polyester, with a spiral enclosed between the layers. The duct can be attached to round and oval connection parts without any problems.

Because of the "sandwich construction", the different layers of polyester and aluminium are overlapping each other completely. Both in- and outside of the duct are covered with polyester with aluminium in between.

Determination of the acute toxicity
Stated by the "Institut für Arbeitsmedizin" of the medical faculty of the technical university of Aken. Under the supervision of prof. dr. med. H.J. Einbrodt (specialist) classified as "non toxic".

Applications in practice

ALUDEC® FAAF
- General air supply systems, without special demands
- Air conditioning systems, without special demands

	ALUDEC® FAAF
Mechanical properties	
Temperature range (°C)	-30 - +170
Maximum operating pressure (Pa)	2500
Maximum air velocity (m/s)	30
Diameter range (mm)	82 - 508
Technical data	
Article code	FAAF{Ø}
Material structure	4 layer (2Poly/2Alu)
Wire spacing	25 mm
Minimum bending radius	0.58 x Ø
Standard length (metres)	10
Standard colour	aluminium

The **ALUDEC®** fulfils all the requirements and is classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **ALUDEC®** ducts are not suitable for discharging combustion products from open fireplaces and oil-fired boilers. Neither are the **ALUDEC®** ducts suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product. The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.013 ALUDEC® CLASSIC Laminated ducting

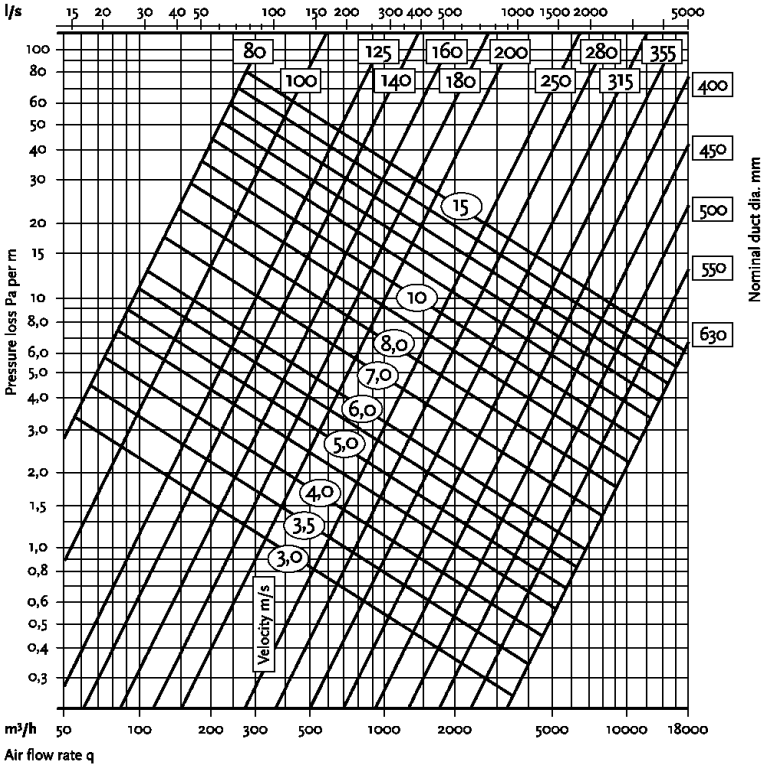
Fully flexible, economic, ducting constructed from multiple layers of aluminum and polyester laminated to encapsulate a high carbon, spring steel wire helix.
ALUDEC CLASSIC installs easily on circular or oval fittings.
ALUDEC CLASSIC flexible ducting is used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

Specifications
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 82mm to 610mm
Standard Length - 10 meter

Classifications
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 0.4, 0.6, or 0.8 meter.

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- Reduced labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling cost

Use Limitations
ALUDEC CLASSIC is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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1.014 ALPHAFLEX Laminated ducting

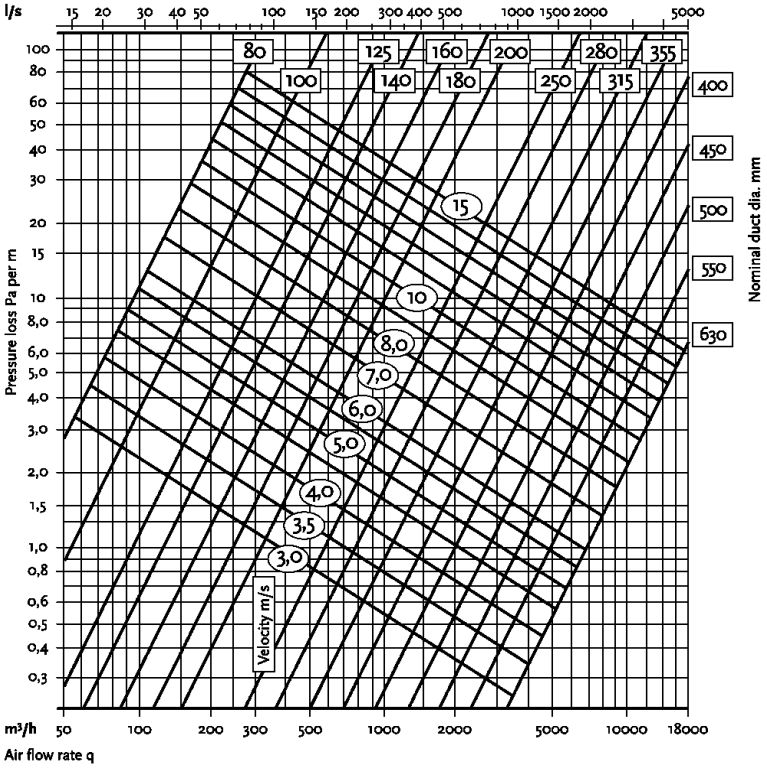
Fully flexible, economic, ducting constructed from multiple layers of aluminum and polyester laminated to encapsulate a high carbon, spring steel wire helix.
ALPHAFLEX installs easily on circular or oval fittings.
ALPHAFLEX flexible ducting is used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

Specifications
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 102mm to 406mm
Standard Length - 10 meter

Classifications
EU – EN 13501/1: CE - B,s1,d0
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 0.4, 0.6, or 0.8 meter.

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- Reduced labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling cost

Use Limitations
ALPHAFLEX is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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1.020 COMBIDEC® Laminated ducting

COMBIDEC® ducts are solid, very flexible, ectremly strong laminate ducts for different ranges of application. The duct consists of several layers of aluminum, polyester and copolymer. The ducts can be attached easily to round and oval connection parts. The fire resistance of the **COMBIDEC®** ducts has been tested in several countries, according to the current international standards.

The base of the **COMBIDEC®** series is an aluminum laminate duct with an outer jacket of copolymer. The used laminate has been composed of a "sandwich construction". The different layers of copolymer and aluminum are overlapping each other completely. This provides a very strong construction. The outer jacket is wear resistant and steam-tight.

The advantages of a **COMBIDEC®** duct towards PVC ducting:
- Higher temperature resistance,
- Less smoke development in the case of fire.

The advantages of a **COMBIDEC®** duct towards aluminium laminated ducting:
- Higher tear resistance.
- Better mechanical protection against external influences.
- Better resistance under local pressure.
- Higher resistance against puncture.

Applications in practice
- Steam return lines
- Applications where good mechanical strength is required
- to use in devices
- for mechanical aeration

	COMBIDEC® 2000	**COMBIDEC® 2100**	**COMBIDEC® 2300**
Mechanical properties			
Temperature range (°C)	-30 - +140	-30 - +140	-30 - +140
Maximum operating pressure (Pa)	+3000	+3000	+3000
Maximum velocity of air (m/s)	30	30	30
Diameter range (mm)	102 - 508	82 - 508	76 - 710
Fire classes according to			
The Netherlands (NEN 6065/6066)	1 and 3	1 and 3	1 and 3
Germany (DIN 4102)	B2	B2	B2
France (CSTB)	x	x	M2
Switzerland (BKZ)	x	5.2	black 5.2
United Kingdom (BS 476)	6,7 and 20	7 and 20	6, 7 and 20
Austria (B3800)	x	B2	B2
Italy (CSI)	Class 2	x	x
Sweden (Swedcert/Kiwa)	x	x	BBR TG0025&TG0051
Technical data			
Article code	DC20[G/W/B]{Ø}	DC21[G/W/B]{Ø}	DC23[G/W/B]{Ø}
Material structure	6 layers	6 layers	5 layers
Wire spacing -Upto ø102 mm -ø102 mm and larger	- 36 mm	25mm 18 mm	25 mm 18 mm
Minimum bending radius	0.54 x Ø	0.58 x Ø	0.58 x Ø
Standard length (meters)	10	10	10
Standard colour *	Grey	Grey	Grey

* Also available in Black and White

The **COMBIDEC®** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **COMBIDEC®** ducts are not suitable for discharging combustion products from open fireplaces and oil-fired boilers. Neither are the **COMBIDEC®** ducts suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
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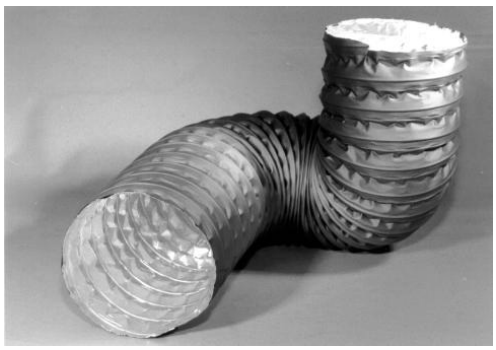
1.021 COMBIDEC® CLASSIC Laminated ducting

Fully flexible, economic, ducting constructed from multiple layers of aluminum and polyester, and PVC laminated to encapsulate a high carbon, spring steel wire helix. COMBIDEC CLASSIC installs easily on circular or oval fittings.
COMBIDEC CLASSIC flexible ducting is used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

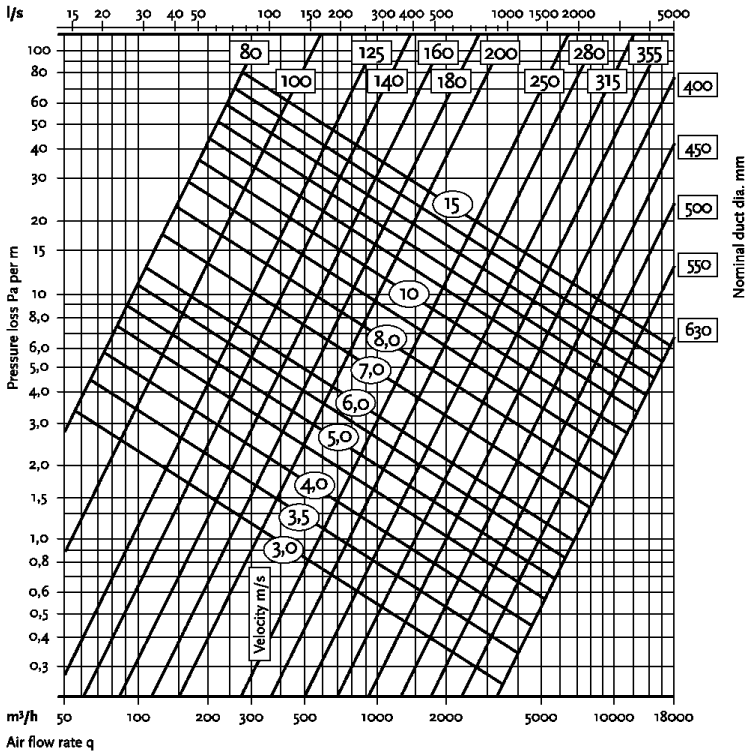
Specifications
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 102mm to 508mm
Standard Length - 10 meter
Appearance - Aluminum / Grey

Classifications
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 0.6, or 0.8 meter.



Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
Quick Installation
Reduced labor cost

Air Tight Construction
Energy efficient
Low air leakage

Smooth Interior
Low friction loss
Low operating cost

Multi-Layer Construction
Tear & Puncture Resistant
Low maintenance

Light Compact Packaging
Reduced warehouse and handling cos

Use Limitations
COMIDEC CLASSIC is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

The information contained in this brochure was current on the publication date. The Company reserves the right to make changes in details at any time without prior notice. In order to avoid misunderstandings, any interested party is advised to contact the Company checking for any changes in materials and/or information after this brochure was published.
Version 2013
DEC International® P.O.Box35, NL-7500AA, Enschede, The Netherlands, www.decinternational.com

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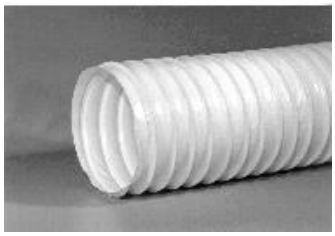
1.030 GREYDEC® & PVC White Synthetic ducting

SYNTHETIC ducts are completely flexible, ducts for several applications. The ducts are suitable for flexible mounting and can be mounted to round and oval connection pieces.
The **GREYDEC®** ducts are also capable of absorbing prolonged vibrations because of its mechanical strength

The **SYNTHETIC DUCT-** series consists of:
- The **GREYDEC® 100**: consisting of a polyester fabric, coated on both sides with a copolymer. The spiral wire has been inserted into the fabric.
- The **GREYDEC® 200**: consisting of a fireproof glassfibre fabric, coated on both sides with a copolymer. The spiral wire has been inserted into the fabric.
- The **PVC**: Very flexible duct consisting of PolyVinylChlorid.



APPLICATIONAS IN PRACTICE.
GREYDEC® 100 & 200
- Mechanical air supply systems
- Machine exhausting
- Air supply and ventilation systems
- Air supply cabinet in air conditioning systems
- Suction of welding fumes
- Vehicle exhaust extraction for repair shops

PVC
- Mechanical air supply systems
- Air conditioning systems
- Exhausting/discharging at domestic equipment like clothes driers
- Ventilation cabinets

		PVC	GREYDEC® 100	GREYDEC® 200
Mechanical properties				
Temperature range (°C)		-20 - +70	-30 - +80	-30 - +80
Maximum operating pressure (Pa)		+3000	+3000	+3000
Maximum air velocity (m/s)		30	30	30
Diameter range (mm)		82 - 203	76 - 710	76 - 710
Fire classes according to				
France (CSTB)		x	x	x
United Kingdom (BS 476)		x	x	Part 6, 7 & 20
Sweden (BBR)		x	approval	approval
Technical data				
Article code		P{Ø}	DG1{Ø}	DG2{Ø}
Material structure		1 layer	1 layer	1 layer
Wire spacing	Ø 76 - 90 mm	25 mm	33 mm	33 mm
	Ø 102 - 120 mm	36 mm	38 mm	38 mm
	Ø 125 - 406 mm	36 mm	47 mm	47 mm
	Ø 457 and larger		38 mm	38 mm
Minimum bending radius		0.55 x Ø	0.56 x Ø	0.56 x Ø
Standard length (meters)		15	10	10
Standard color		White	Grey *	Grey *

***also available in white, black and blue on request.**

The **Synthetic ducts** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings- Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **SYNTHETIC** ducts are not suitable for transporting air with solvents and a high temperature, like combustion gas and for transporting combustion gases from wood-or coal-fired sources of heat.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

The **Greydec®100** and **PVC** are also available as rectangular duct in several sizes and colors.
The standard color is white and the standard length is 6mtr.

Product code Greydec®100:	Product code PVC duct:	Sizes:	Length:
DW1110x54/6	P110x54/6	110mm x 54mm	6Mtr
DW1140x54/6	P140x54/6	140mm x 54mm	6Mtr
DW1180x54/6	P180x54/6	180mm x 54mm	6Mtr
DW1195x54/6	P195x54/6	195mm x 54mm	6Mtr
DW1222x58/6	P222x58/6	222mm x 58mm	6Mtr
DW1115x55/6	P115x55/6	115mm x 55mm	6Mtr
DW1150x70/6	P150x70/6	150mm x 70mm	6Mtr

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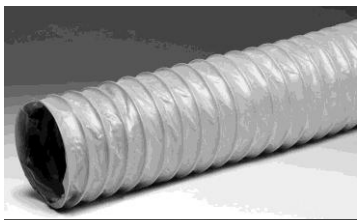
1.031 PVC Grey G1, G2, G1PV & G2PV

Synthetic(insulated)ducting

Description:
G1,G2: Fully flexible, tough, "Grey" un-insulated noise reducing co-polymer flexible duct for use in commercial HVAC systems.
- Easy and fast installation over round or oval connections.
- Tough and air tight with smooth core for low friction loss and lower operation costs.



Construction:
G1: Single layer of a strong 'Grey PolyVinylChlorid co-polymer' encapsulating a copper plated high tensile steel wire helix.
G2: Double layer of a strong 'Grey PolyVinylChlorid co-polymer' encapsulating a copper plated high tensile steel wire helix.

Description:
G1PV, G2PV : Fully flexible high quality factory **insulated** duct for all low/medium pressure air-conditioning and ventilation systems requiring thermal insulation.
- Fast and easy to install over either round or oval connections.
- Tough and air tight with smooth core giving low friction loss and lower operation costs.

Construction:
G1PV, G2PV: Outer vapour barrier of tough 'Grey PolyVinylChlorid co-polymer construction'. The inner core has single layer(G1PV) or a double layer(G2PV) of a tough noise reducing 'Grey PolyVinylChlorid co-polymer' flexible duct encapsulating a copper plated high tensile steel wire helix.

	G1	G1PV	G2	G2PV
Mechanical properties				
Temp. range (°C) Inner duct Outer duct	-20 - +70 -	-20 - +70 -20 - +70	-20 - +70 -	-20 - +70 -20 - +70
Maximum operating pressure (Pa)	+2500	+2500	+2500	+2500
Maximum air velocity (m/s)	25	25	25	25
Diameter range (mm)	82 - 203	82 - 203	82 - 203	82 - 203
Technical data				
Article code	G1{Ø}	G1PV{Ø}	G2{Ø}	G2PV{Ø}
Material structure Inner duct Outer duct	1 layer -	1 layer 1 layer	2 layer -	2 layer 1 layer
Wire spacing	25 mm	25 mm	25 mm	25 mm
Minimum bending radius	0.54 x Ø	0.54 x Ø + ↕	0.54 x Ø	0.54 x Ø + ↕
Standard length (meters)	10	10	10	6
Standard color	Grey	Grey	Grey	Grey

↕ = thickness of glass wool

The **Synthetic ducts** fulfills all the requirements and are classified as specified within:
EN 13180: "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **SYNTHETIC** ducts are not suitable for transporting air with solvents and a high temperature, like combustion gas and for transporting combustion gases from wood-or coal-fired sources of heat.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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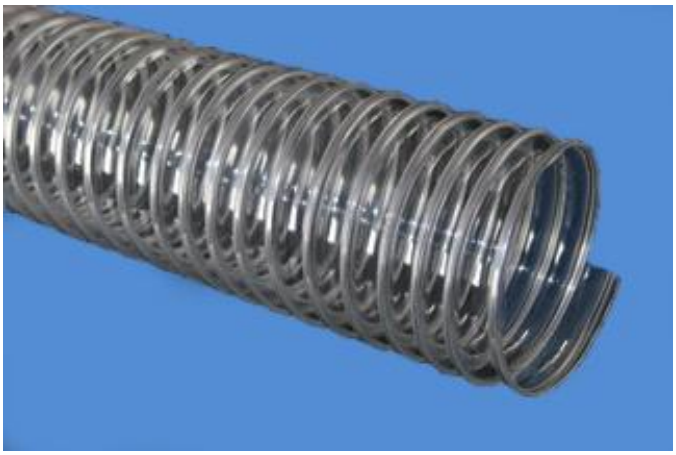
1.032 PU-W Air extraction hose, light weight
(PU-W-hose)



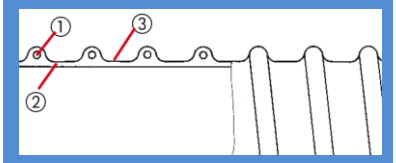
Material
Wall composition:
pure polyester polyurethane (according to DIN 53 516 more resistant to wear than comparable polyether polyurethane)
Spiral coil: spring steel helix wire

Temperature range
from -40 °C to + +90 °C

Cross-section:
from 76 mm to 635 mm

Wall thickness:
0.5 mm

Length:
max. 10 m



Construction
1/ Spring steel Helix

2/ Wall: Polyester polyurethane

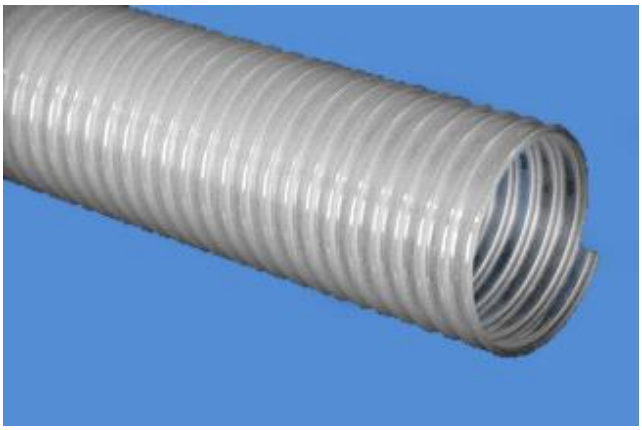
3/ Wall thickness between the windings ca. 0.5 (mm)

Applications
- extraction and transport hose for solids causing wear.
- gaseous and liquid mediums
- extraction of paper and textile fibres
- transport of fine grained particles such as dust and powder
- extraction of oil mists
- protection hose against against mechanical loads

Properties
- extremely wear resistant
- oil and petrol resistant
- gas proof
- good resistance against chemicals
- halogen free
- does not contain plasticizers/softeners
- in general, good UV and ozone resistance
- light weight
- extremely flexible
- smallest bending radius
- high tensile strength and resistance to cracking
- inside largely smooth
- technically optimal flow
- in accordance with TRBS 2153 (Zone 1, 21) for non-flammable substances/bulk goods and gases/ liquids with low conductivity for draining electrostatic charges from grounding occurring on both sides of the spiral coil ends
- in accordance with RoHS

Article no: PUW{Ø}/L							
Interior Ø = D	**Tol.**	**Exterior Ø = D**	**Tol.**	**Bending radius**	**Length**	**Weight**	**Max. neg. pressure**
mm		**mm**		**ca. mm**	**m**	**g/m**	**mbar**
76	+3/0	80	+4/0			410	320
82	+3/0	86	+4/0			441	316
90	+3/0	94	+4/0			483	312
102	+3/0	107	+4/0			559	306
112	+3/0	117	+4/0			611	301
120	+3/0	125	+4/0			653	298
127	+3/0	132	+4/0			690	296
133	+3/0	138	+4/0			721	293
140	+3/0	145	+4/0			758	291
152	+3/0	157	+4/0			821	288
165	+3/0	170	+4/0			889	284
185	+4/0	190	+6/0			994	279
203	+4/0	209	+6/0	R = D	6/10	1089	275
229	+4/0	233	+6/0			1225	270
254	+4/0	258	+6/0			1357	266
280	+4/0	284	+6/0			1493	250
305	+6/0	309	+9/0			2020	250
315	+6/0	319	+9/0			2085	240
356	+6/0	360	+9/0			2352	230
406	+6/0	413	+9/0			2683	220
457	+6/0	464	+9/0			3020	200
508	+9/0	515	+11/0			3357	190
560	+9/0	567	+11/0			3700	180
610	+9/0	617	+11/0			4031	160
635	+9/0	642	+11/0			4196	150

1.032 PU Air extraction hose, light weight (PU hose)



Material

Wall composition:
pure polyester polyurethane (according to DIN 53 516 more resistant to wear than comparable polyether polyurethane)
Spiral coil: Hard PVC spiral coil

Applications

- extraction and transport hose for solids causing wear.
- gaseous and liquid mediums
- extraction of paper and textile fibres
- transport of fine grained particles such as dust and powder
- extraction of oil mists
- protection hose against mechanical loads

Properties

- extremely wear resistant
- oil and petrol resistant
- gas proof
- good resistance against chemicals
- does not contain plasticizers/softeners
- halogen free
- in general, good UV and ozone resistance
- light weight
- extremely flexible
- smallest bending radius
- high tensile strength and resistance to cracking
- inside largely smooth
- technically optimal flow
- in accordance with TRBS 2153 (Zone 1, 21) for non-flammable substances/bulk goods and gases/ liquids with low conductivity for draining electrostatic charges from grounding occurring on both sides of the spiral coil ends
- in accordance with RoHS

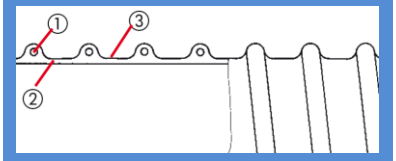
Article no: PU{Ø}/L					
Interior Ø = D	**Tol.**	**Bending radius**	**Length**	**Weight**	**Max. neg. pressure**
mm		**ca. mm**	**m**	**g/m**	**mbar**
20	+0,7	27		81	352
22	+0,7	29		104	352
25	+0,7	33		128	352
28	+0,7	36		152	352
30	+0,7	39		166	352
32	+1,0	41		198	352
35	+1,0	44		230	352
38	+1,0	48		254	352
40	+1,0	50		278	352
45	+1,0	55		358	350
50	+1,0	60		319	350
52	+1,0	63		372	349
60	+1,2	72		426	348
63	+1,2	75		478	348
70	+1,2	85		576	347
75	+1,2	90	6/10/20	694	346
80	+1,2	96		731	346
90	+1,2	110		772	345
100	+1,5	120		1094	344
110	+1,5	132		1232	343
120	+1,5	144		1544	342
125	+1,5	150		1644	342
130	+1,5	156		1680	342
140	+1,5	168		1756	341
150	+2,0	180		1912	340
160	+2,0	190		2044	340
170	+2,0	200		2156	340
180	+2,0	210		2248	339
190	+2,0	222		2420	339
200	+2,0	235		2640	338
250	+2,0	290		2784	336

Temperature range
from -40 °C to + +90 °C
short time to + +125 °C

Cross-section:
from 20 mm to 250 mm

Wall thickness:
0.6 mm

Length:
max. 20 m



Construction
1/ Hard PVC spiral coil

2/ Wall: polyester polyurethane

3/ Wall thickness between the windings ca. 0.6 mm

Chemische Beständigkeit

Die Beständigkeit gegenüber Chemikalien ist typabhängig. Einfluss haben sowohl die Rohstoffbasis (Polyester oder Polyether) als auch die Härte. Die nachfolgende Tabelle sol der Orientierung dienen. Sie enthält Angaben für vier charakteristische Typen:

- 385 als weicher Esthertyp.
- 359 als harter Estertyp
- 786 als Ethercarbonat-TPU und
- 955 U als hartes Etherprodukt

Die Produkte der Reihen 100, 400 und 500 (außer 588) zeigen ähnliches Verhalten wie die Estertypen 385 und 359, 588 ist eher mit 786 vergleichbar.

Beständigkeit gegen Lösemittel

Der Kontakt mit Lösemitteln bewirkt häufig eine Quellung des Materials. Diese ist normalerweise reversibel, kann aber bei höheren Temperaturen und längerer Dauer bis zum Abbau führen. Weichere Produkte sind generell anfälliger.

Im Einzelnen bewirken Aromaten und polare aliphatische Lösemittel wie z. B. Ketone, (kurzkettige) Ester und halogenierte Kohlenwasserstoffe ein starkes Aufquellen des Materials und einen mit steigender Quellung zunehmenden Abfall der Festigkeit. Der Vorgang der Quellung und der damit verbundene Einfluss auf die Festigkeit sind reversibel.

In polaren Lösemitteln wie Dimethylformamid, Tetrahydrofuran oder N-Methylpyrrolidon wird es ganz oder teilweise gelöst.

Beständigkeit gegen Alkohol

Alkohole können dass Material durch Alkoholyse abbauen, besonders bei höheren Temperaturen.

Chemical Resistance

The chemical resistance varies as a funktion of the particular grade involved. Both the raw materials base (polyester or polyether) and the hardness of the grade affect its chemical resistance. The Table included in this ATI provides guidance for the four characteristic grades of

- 385, as a flexible ester grade
- 359, as a hard ester grade
- 786, as an ether carbonate TPU
- 955 U, as a hard ether product

Products from the 100, 400 and 500 series of grades (with the exception of 588) display similar behaviour to ester grades 385 and 359. 588 is more similar to 786 in terms of its behaviour.

Resistance to solvents

Contact with solvents frequently causes the material to swell. This is normally reversible but, in the case of high temperatures and prolonged contact, degradation can result. More flexible products are generally more susceptible to swelling.

Aromatics and polar aliphatic solvents, such as ketones, (short-chain) esters and halogenated hydrocarbones cause pronounced swelling in the material. Increased swelling goes hand in hand with a progressive reduction in strength. The swelling process and associated effect on strength are reversible.

Polar solvents, such as dimethyl formamide, tetrahydrofurane or N-methyl pyrrolidone, cause partial or complete dissolution.

Resistance to alcohol

Alcohols can break down this material through alcoholysis, particularly at high temperatures.

Beständigkeit gegen Wasser und neutrale wässrige Salzlösungen

Bei Normaltemperatur ist jahrelanger Kontakt (auch mit Seewasser) ohne wesentliche Änderungen der mechanischen Eigenschaften möglich. Höhere Wassertemperaturen bewirken ein Abfallen der Festigkeit und ab 60 °C bei den Estertypen einen zunehmenden hydrolytischen Abbau.

Ethertypen quellen in heißem Wasser. Die sich dabei einstellenden Eigenschaften bleiben dann über längere Zeit konstant.

Beständigkeit gegen Treibstoffe

Die Beständigkeit gegen Treibstoffe ist von deren Zusammensetzung abhängig. Im Kontakt mit Treibstoffen, die überwiegend aliphatischen Charakter haben – wie Normalbenzin, Dieselöl oder Kerosin – , ist es gut beständig.

Bei Treibstoffen, die Alkohol enthalten, kann nach längerer Einwirkzeit eine Schädigung auftreten.

Aromatische Treibstoffe, z.B. Superbenzin, quellen entsprechend ihrem Gehalt und der Art von aromatischen Bestandteilen es reversibel an.

Beständigkeit gegen Öle und Fette

Es ist sehr gut beständig gegen reine mineralische Öle (Schmieröle) und wasserfreie Fette. Speziell modifizierte Hochleistungsschmiermittel können selbst oder durch ihre Additive – vor allem bei höheren Temperaturen – mit diesem Material unverträglich sein. Hier empfiehlt es sich, vor der Anwendung Einfluss auf die mechanischen Eigenschaften und das Quellverhalten zu überprüfen.

Beständigkeit gegen Säuren und Laugen

Kurzzeitiger Kontakt mit konzentrierten Mineralsäuren ist bei Raumtemperatur möglich, wenn die Kontaktstelle anschließend schnell mit Wasser gereinigt wird. Gegen verdünnte Mineralsäuren ist es bei Raumtemperatur bedingt beständig. Organische Säuren und deren wässrige Lösungen schädigen das Material schneller als anorganische Säuren.

Für Laugen gilt, wie bei den Säuren, dass bei starker Verdünnung auch ein längerer Kontakt möglich ist.

Resistance to water and neutral aqueous saline solutions

At normal temperatures, the material can remain in contact with water (including sea-water) for many years without experiencing any essential changes in its mechanical properties. Higher water temperatures cause a reduction in strength, and temperatures in excess of 60 °C lead to progressive hydrolytic degradation in ester grades.

Ether types swell in hot water. The resultant properties then remain constant for a long period of time.

Resistance to fuels

The resistance to fuels is determined by the composition of the fuel involved. It displays good resistance when in contact with fuels of a primarily aliphatic nature – such as standard petrol, diesel oil and kerosine.

In the case of fuels that contain alcohol, damage can occur after a prolonged period of contact.

Aromatic fuels, such as premium-grade petrol, cause reversible swelling in the material. The extent of the swelling correlates with the content and nature of the aromatic ingredients that they contain.

Resistance to oils and greases

It is particularly resistant to pure mineral oils (lubricating oils) and water-free greases. Specially modified high performance lubricants may be incompatible with this material (either the lubricants themselves or their additives), particularly at high temperatures. It is recommended that the effect on mechanical properties and the swelling behaviour be checked before lubricants of this type are applied.

Resistance to acids and alkaline solutions

Brief contact with concentraded mineral acids is possible at room temperature, providing that the point of contact is rapidly cleaned with water afterwards. It displays limited resistance to dilute mineral acids at room temperature. Organic acids and aqueous solutions of these damage the material more rapidly than inorganic acids.

The same applies for alkaline solutions as for acids: longer contact is possible with highly diluted solutions.

Medium	**Temperatur / Temperature °C**		**385** 85 A	**359** 59 D	**786** 87 A	**955 U** 55 D
Aceton / Acetone	RT	Q	0	0	0	0
Al-Chlorid wässrig, 5-prozentig / Al-chloride, aqueous, 5 %	RT		+	+	+	+
Ammoniak, 10-prozentig / Ammonia, 10 %	RT		+	+	+	+
Anilin / Aniline	RT	Q	–	–	–	–
IRM-Öl 901 / IRM oil 901	80		+	+	+	+
IRM-Öl 902 / IRM oil 902	80		+	+	+	+
IRM-Öl 903 / IRM oil 903	80		0/+	0/+	+	+
Benzin, „normal“ Petrol, standard grade	RT	Q	+	+	+	+
Benzin, „super“ / Petrol, premium grade	RT	Q	0/+	+/0	+/0	+/0
Benzol / Benzene	RT	Q	0	0	0	0
Butanol / Butanol	RT		0	+/0	0	+/0
Butylacetat / Butyl acetate	RT	Q	–	0	–	0
Cyclohexanol / Cyclohexanol	RT	Q	0	+/0	0	+/0
Dieselöl / Diesel oil	RT	Q	+	+	+	+
Dimethylformamid / Dimethyl formamide	RT	Q	–	–	–	–
Fe-Chlorid wässrig, 5-prozentig Fe chloride, aqueous, 5 %	40		0	0	0	0
Ethylacetat / Ethyl acetate	RT	Q	–	0	–	0
Ethylalkohol / Ethyl alcohol	RT	Q	0	+/0	0	+/0
Ethylether / Ethyl ether	RT	Q	+	+	+	+
Essigsäure, 20-prozentig / Acetic acid, 20 %	RT		0	0	0	0
Kalilauge 1N / Potassium hydoxide solution 1 N	RT		+/0	+/0	+/0	+/0
Kochsalzlösung, konzentriert / Sodium chloride solution, conc.	RT		+	+	+	+
Isopropanol / Isopropanol	RT	Q	0	+/0	0	+/0
Methanol / Methanol	RT	Q	0	+/0	0	+/0
Methanol/Benzin, 15/85 / Methanol/benzene, 15/85	RT	Q	+/0	+/0	+/0	+/0
Methylenchlorid / Methylene chloride	RT	Q	0/–	0	0/–	0
Methylethylketon / Methyl ethyl ketone	RT	Q	0	0	0	0
Mineralöl / Mineral oil	80		+	+	+	+
Natriumseifenfett / Soda soap fat	RT		+	+	+	+
Natriumseifenfett + 20 % Wasser Soda soap fat + 20 % water	80		+/0	+/0	+/0	+/0
Natronlauge N / Sodium hydroxide solution N	RT		+/0	+/0	+/0	+/0
N-Methylpyrrolidon / N-methyl pyrrolidone	RT	Q	–	–	–	–
Salpetersäure, 20-prozentig / Nitric acid, 20 %	RT		–	–	–	–
Salzsäure, 20-prozentig / Hydrochloric acid, 20 %	RT		0	0	0	0
Schwefelsäure, 20-prozentig / Sulphuric acid, 20 %	RT		0	0	0	0
Seewasser / Sea water	RT		+[1)]	+	+	+
Tetrachlorkohlenstoff Carbon tetrachloride	RT	Q	0/–	0	0	0
Trichlorethylen / Trichloro-ethylene	RT	Q	0/–	0	0	0
Tetrahydrofuran / Tetrahydrofurane	RT	Q	–	–	–	–
Toluol / Toluene	RT	Q	–	0/–	–	0/–
Wasser / Water	RT 80 100		+ 0/+ 0	+ 0/+ 0	+ +/0 0/+	+ +/0 0/+

+ = über längere Zeit beständig
0 = kurzzeitiger Kontakt unter bestimmten Voraussetzungen möglich
– = unbeständig, starker Angriff oder löslich
[1)] = Mikrobenangriff möglich
Q = Quellung / reversibel; die mechanischen Eigenschaften werden im gequollenen Zustand vermindert (gilt für alle Typen).
RT= Raumtemperatur 23 °C

+ = resistant over a prolonged period
0 = short-term contact possible under certain conditions
– = not resistant, pronounced attack or dissolution
1) = microbial attack possible
Q = swelling / reversible; mechanical properties are somewhat impaired in the swollen state (applies to all grades).
RT= room temperature 23 °C

Bayer-Kunststoffe im Internet / Bayer plastics on the Internet: http://www.plastics.bayer.com

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Unless specified to the contrary, the values given have been established on standardised test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that, under certain conditions, the properties can be affected to a considerable extent by the design of the mold/die, the processing conditions and the coloring.

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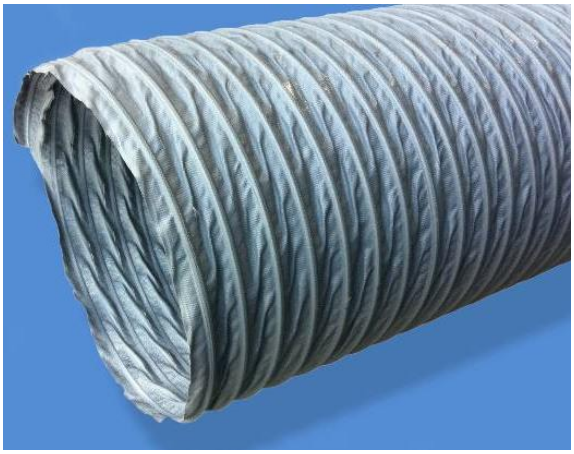
Bayer AG
Geschäftsbereich Kunststoffe
KU-Europa, Informationssysteme
D-51368 Leverkusen
Fax +49 (0)214/30-6 12 77

Bayer

1.033 GREYDEC® 122 - 222 (WELDEC®)
Light weight and very flexible ducting of PVC-coated fabric



Material
- **PVC**-coated polyester fabric (DG122)
- **PVC**-coated glass fabric (DG222)

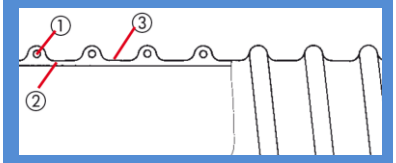
Spiral coil: spring steel helix wire

Colour
Grey, Black, White

Temperature range
from -30 °C to +80 °C

Cross-section:
from 82 mm to 508 mm

Length:
max. 10 m



Construction
1/ Spring steel Helix

2/ Wall: PVC coated fabric (2 possibilities)

3/ Wall thickness between the windings ca. 0.22 (mm)

Applications
- Air-conditioning
- Suction of air and welding fumes
- domestic appliances
- vehicle exhaust extraction for repair shops

Properties
- Excellent flexibility
- Good compression
- Self-extingguishing

Classifications

Polyester fabric
- German DIN 4102-1 class B2
- Swedish type approval BBR

Glass fabric
- French NF P 92-503 class M1.
- Swedish type approval BBR
- UK BS476 - part 6, 7 and 20

Technical data

Article code	Interior Ø = D	Max Vacuum	Bending radius	Material thickness	Lenght
	mm	mbar	mm	mm	m
DG122Ø and DG222Ø range			R = D		1,2,3,4,5,10
	82	163		0.22	
	102	163		0.22	
	127	114		0.22	
	152	85		0.22	
	160	78		0.22	
	165	75		0.22	
	203	53		0.22	
	254	33		0.22	
	508	10		0.22	

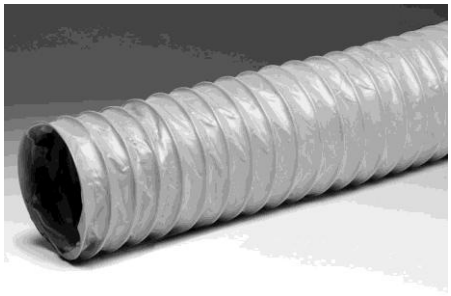
Further design and diameters available upon request
Technical data are based on +20° C

1.034 PVC Grey G1SR(M1)

Synthetic reinforced ducting

Description:
G1SR (M1): Fully flexible, tough, "Grey" un-insulated noise reducing co-polymer flexible duct for use in commercial HVAC systems.
- Easy and fast installation over round or oval connections.
- Tough and air tight with smooth core for low friction loss and lower operation costs.

Construction:
G1SR: Single layer of a strong reinforced 'Grey PolyVinylChlorid co-polymer' encapsulating a copper plated high tensile steel wire helix.



	G1SR	G1SRM1
Mechanical properties		
Temp. range (°C)	-20 - +70	-20 - +70
Maximum operating pressure (Pa)	+2500	+2500
Maximum air velocity (m/s)	25	25
Diameter range (mm)	82 - 406	82 - 406
Fire class according to		
France (CSTB)	x	M1
Sweden (Swedcert/Kiwa)	x	BBR
Technical data		
Article code	G1SR{Ø}	G1SRM1{Ø}
Material structure	1 layer	1 layer
Wire spacing - depending on diameter	33, 39 & 47 mm	33, 39 & 47 mm
Minimum bending radius	0.54	0.54
Standard length (meters)	6	6
Standard color	Grey	Grey

The **G1SR(M1)** ducts fulfills all the requirements and are classified as specified within:
EN 13180: "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **G1SR(M1)** ducts are not suitable for transporting air with solvents and a high temperature, like combustion gas and for transporting combustion gases from wood-or coal-fired sources of heat.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.035 GREYDEC® CLASSIC Synthetic ducting

Fully flexible ducting constructed from PVC-coated polyester fabric spirally wound to encapsulate a high carbon, spring steel wire helix.
Greydec Classic installs easily on circular or oval fittings.
Greydec Classic flexible ducting is used in ventilation aspects where high mechanical strength is required.

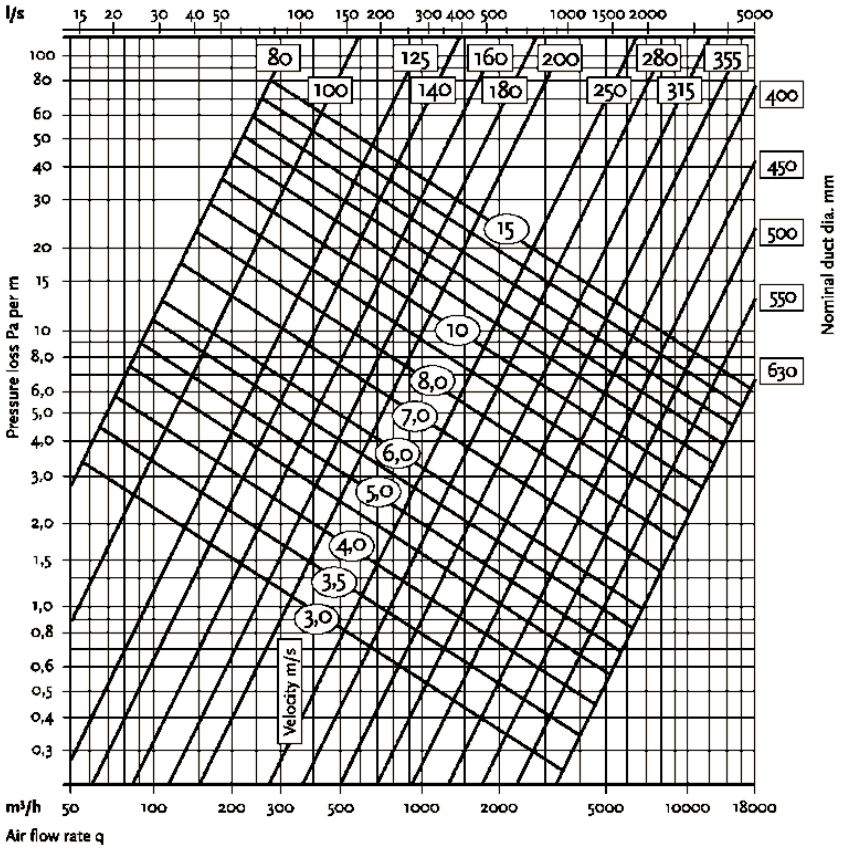
Specifications

Temperature Range - from -10º C to +80º C
Operating Pressure - from -125 to +3000 Pa
Operating Velocity - 30 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 82mm to 610mm
Standard Length - 10 meter
Appearance - Grey

Classifications
Self extinguishing
DIN4102-1: B2
EN13501-1: Bs2d0
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 0.8 meter

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- educed labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling costs

Use Limitations

Greydec Classic is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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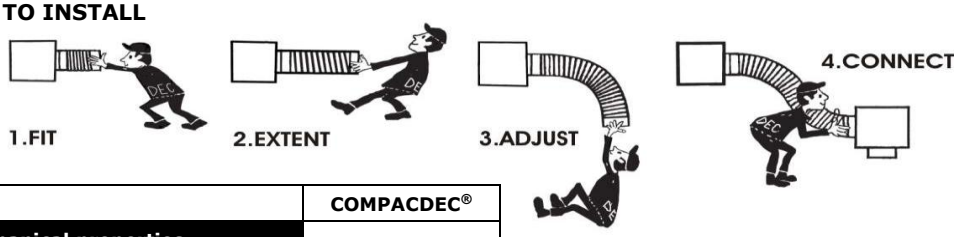
1.041 COMPACDEC® Corrugared ducting

COMPACDEC® is a superb flexible duct constructed of two layers of corrugated aluminium.
By the inter lockseam a high airtighness and flexibility is reached.

COMPACDEC®
- suitable for mechanical air supply systems and air conditioning systems.
- fire resistant according to the German norm **DIN4102** and to the European norm **EN13501-1** and Classified as **A1**.

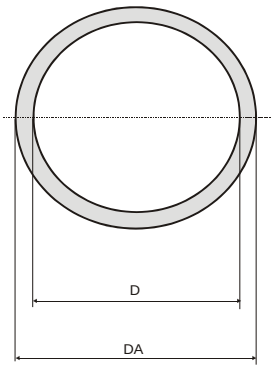
Applications in practice
- Mechanical air supply systems
- Air conditioning systems
- Systems, where vapors should be exhausted
- Above mentioned systems, where a special mechanical strength is required

HOW TO INSTALL



	COMPACDEC®
Mechanical properties	
Temperature range (°C)	-30 - +250
Peak. value (°C)	+400
Max. operating pressure (Pa)	+3000
Max. air velocity (m/s)	30
Diameter range (mm)	050 - 500
Fire classes according to	
Europe (EN13501-1)	A1
The Netherlands (NEN 6065/6066)	1
Germany (DIN 4102)	A1
France (CSTB)	M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	4, 6, 7 and 20
Austria (B3800)	A1
Sweden (Swedcert)	A15
Italy (CSI)	0
Technical Data	
Article code	**DCD2{Ø}**
Material Construction	2 Layers aluminium
Minimum bending radius	1 x Ø
Standard length (meters)	5
Standard Color	Aluminium

D(mm)	Tolerance	DA (mm)
050	+1,0 / -0	057
060	+1,0 / -0	067
075	+1,0 / -0	082
080	+1,0 / -0	087
100	+1,0 / -0	107
125	+1,0 / -0	132
140	+1,0 / -0	147
150	+1,5 / -0	157
160	+1,5 / -0	167
180	+1,5 / -0	187
200	+1,5 / -0	207
224	+1,5 / -0	231
250	+2,0 / -0	257
280	+2,0 / -0	287
300	+2,0 / -0	307
315	+2,0 / -0	322
355	+2,0 / -0	362
400	+2,0 / -0	407
450	+2,5 / -0	457
500	+2,5 / -0	507



The **COMPACDEC®** fulfills all the requirements and are classified as specified within: **EN 13180 :** "*Ventilation for buildings- Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **COMPACDEC®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
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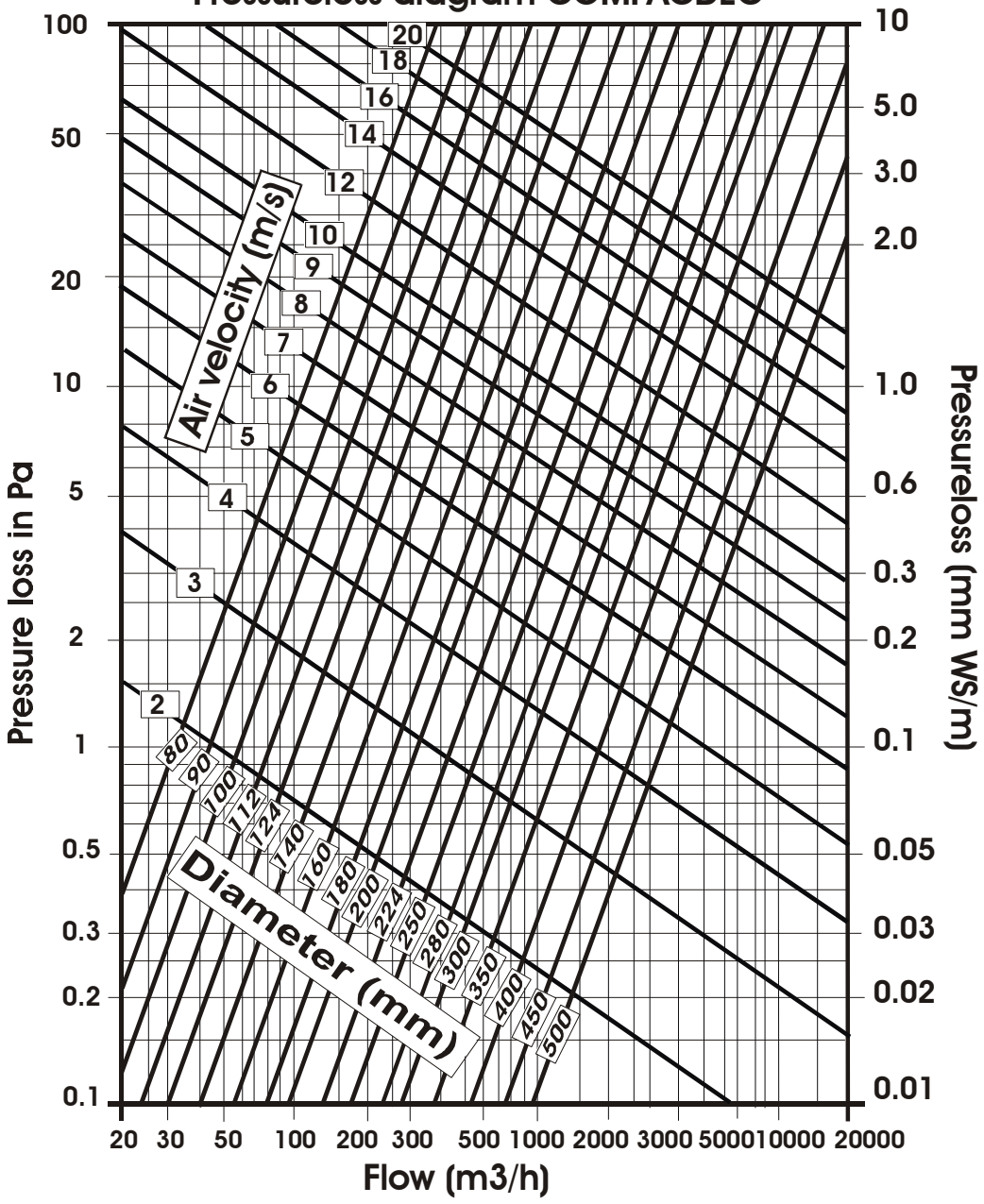
Pressureloss diagram COMPACDEC®



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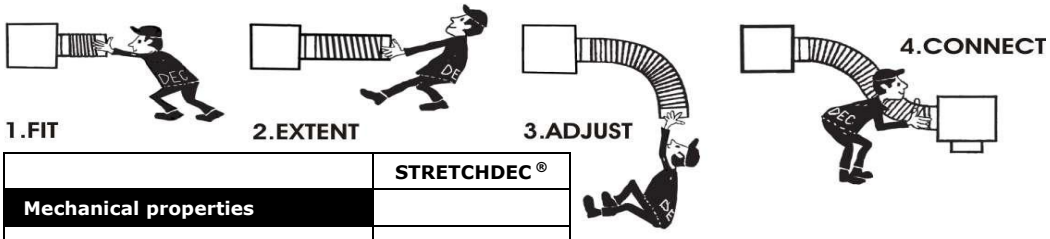
1.042 STRETCHDEC® Corrugared ducting

STRETCHDEC® is a superb flexible duct constructed of one layer of corrugated aluminium. By the inter lockseam a high airtighness and flexibility is reached.

STRETCHDEC®
- suitable for mechanical air supply systems and air conditioning systems.
- fire resistant according to the German norm **DIN4102** and to the European norm **EN13501-1** and Classified as **A1**.

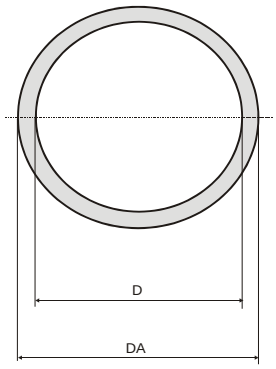
Applications in practice
- Mechanical air supply systems
- Air conditioning systems
- Systems, where vapors should be exhausted
- Above mentioned systems, where a special mechanical strength is required

HOW TO INSTALL



	STRETCHDEC®
Mechanical properties	
Temperature range (°C)	-30 - +250
Peak. value (°C)	+400
Max. operating pressure (Pa)	+3000
Max. air velocity (m/s)	30
Diameter range (mm)	080 - 315
Fire classes according to	
Europe (EN13501-1)	A1
The Netherlands (NEN 6065/6066)	1
Germany (DIN 4102)	A1
France (CSTB)	M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	4, 6,7 and 20
Austria (B3800)	A1
Sweden (Swedcert)	A15
Italy (CSI)	0
Technical Data	
Article code	**DXG{Ø}**
Material Construction	1 Layer Aluminium
Minimum bending radius	0.76 x Ø
Standard length (meters)	3
Standard Color	aluminium

D(mm)	Tolerance	DA (mm)
080	+1,0 / -0	087
100	+1,0 / -0	107
125	+1,0 / -0	132
150	+1,5 / -0	157
160	+1,5 / -0	167
180	+1,5 / -0	187
200	+1,5 / -0	207
224	+1,5 / -0	231
250	+2,0 / -0	257
300	+2,0 / -0	307
315	+2,0 / -0	322



The **STRETCHDEC®** fulfills all the requirements and are classified as specified within: **EN 13180 :** "*Ventilation for buildings- Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **STRETCHDEC®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
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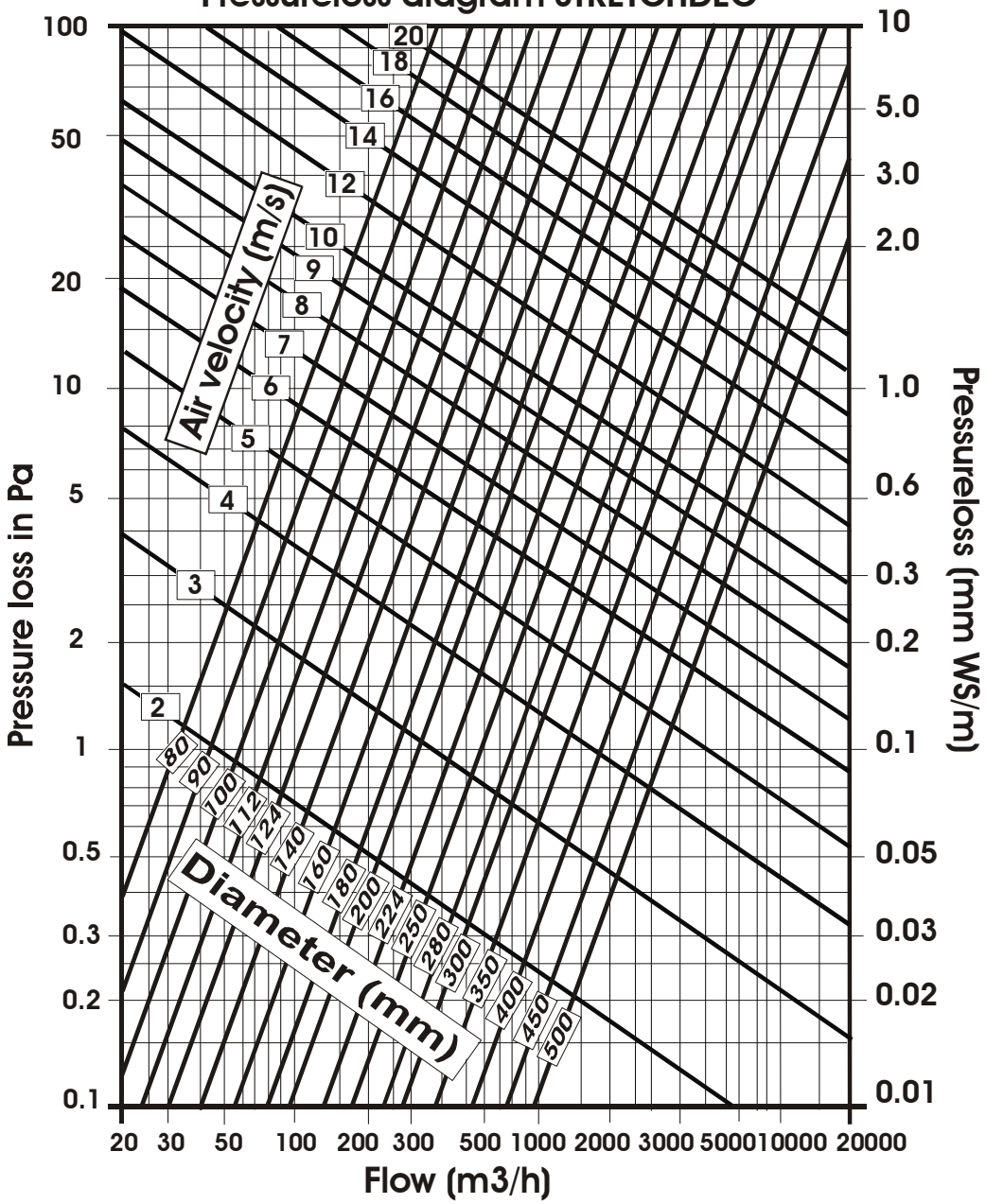
Pressureloss diagram STRETCHDEC®



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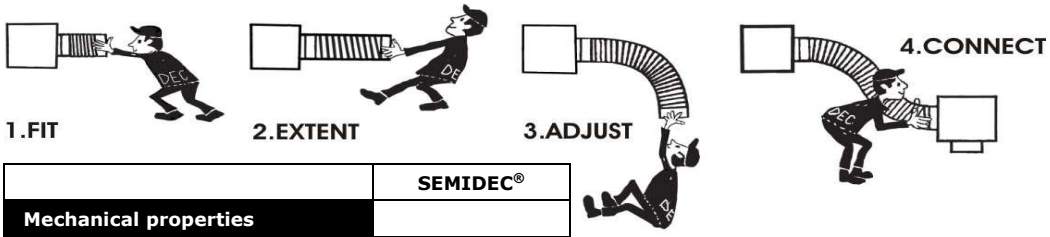
1.043 SEMIDEC® Corrugated ducting

SEMIDEC® is a superb flexible duct constructed of one layer of corrugated aluminium.
By the interlock seam a high air tightness and flexibility is reached.

SEMIDEC®
- suitable for mechanical air supply systems and air conditioning systems.
- fire resistant according to the German norm **DIN4102** and to the European norm **EN13501-1** and Classified as **A1**.

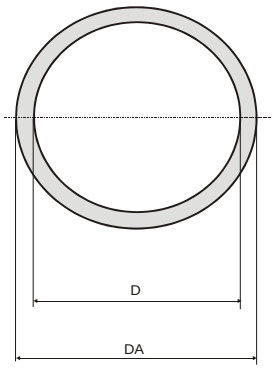
Applications in practice
- Mechanical air supply systems
- Air conditioning systems
- Systems, where vapors should be exhausted
- Above mentioned systems, where a special mechanical strength is required

HOW TO INSTALL



	SEMIDEC®
Mechanical properties	
Temperature range (°C)	-30 - +250
Peak. value (°C)	+400
Max. operating pressure (Pa)	+3000
Max. air velocity (m/s)	30
Diameter range (mm)	050 - 400
Fire classes according to	
Europe (EN13501-1)	A1
The Netherlands (NEN 6065/6066)	1
Germany (DIN 4102)	A1
France (CSTB)	M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	4, 6, 7 and 20
Austria (B3800)	A1
Sweden (Swedcert)	A15
Italy (CSI)	0
Technical Data	
Article code	**DXD{Ø}**
Material Construction	1 Layer Aluminium
Minimum bending radius	1 x Ø
Standard length (meters)	3
Standard Color	Aluminium

D(mm)	Tolerance	DA (mm)
050	+1,0 / -0	057
060	+1,0 / -0	067
075	+1,0 / -0	082
080	+1,0 / -0	087
100	+1,0 / -0	107
125	+1,0 / -0	132
140	+1,0 / -0	147
150	+1,5 / -0	157
160	+1,5 / -0	167
180	+1,5 / -0	187
200	+1,5 / -0	207
224	+1,5 / -0	231
250	+2,0 / -0	257
280	+2,0 / -0	287
300	+2,0 / -0	307
315	+2,0 / -0	322
355	+2,0 / -0	402
400	+2,0 / -0	407



The **SEMIDEC®** fulfills all the requirements and are classified as specified within: **EN 13180 :** "*Ventilation for buildings- Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **SEMIDEC®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
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These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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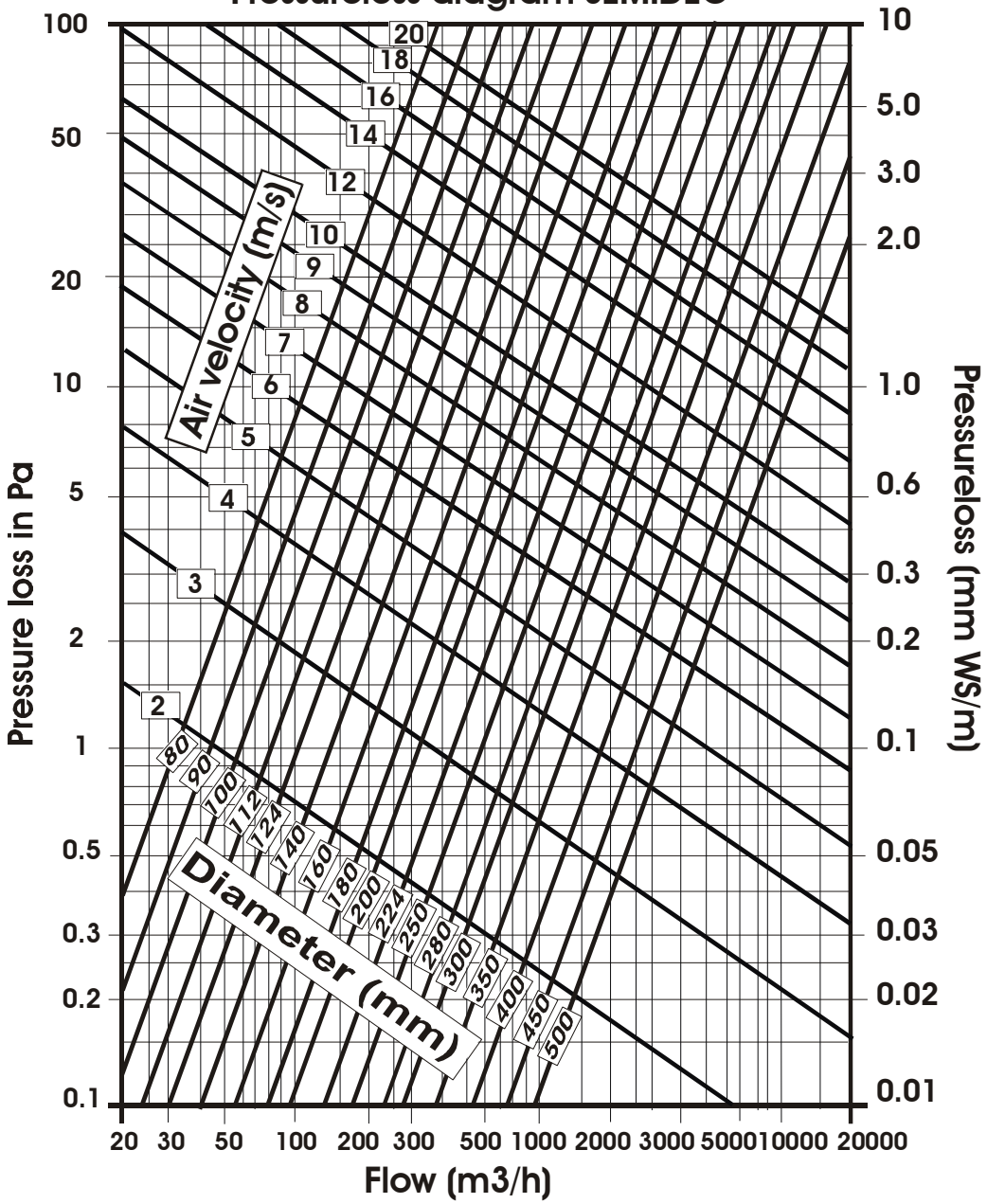
Pressureloss diagram SEMIDEC®



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1.044 SEMIDEC® Galvanized

Corrugated steel ducting

SEMIDEC® Galvanized is a superb flexible duct constructed of one layer of corrugated galvanized steel 80 Microns. By the inter lock seam a high air tightness and flexibility is reached.

- Suitable for mechanical air supply systems and air conditioning systems.
- Classified as raw material according to the German norm DIN4102 and to the European norm EN13501-1 as A1. M0 in France
- 100% recyclable

Applications in practice
- Mechanical air supply systems
- Air conditioning systems
- Systems, where vapours should be exhausted

How to install
The **SEMIDEC® Galvanized** ducts can easily be cut with a metal saw or a sharp blade. The bending is done by hand. Connecting a **SEMIDEC® Galvanized** duct can be done by simple fitting to an apparatus. Sealing is achieved with a tape sealing or sealant. The fixing is conducted by a clamp placed on the tape adhesive, by rivets or by self-drilling screws.
The assembly of two lengths requires the use of a male fitting of Galvanized steel or aluminium.

PACKAGING
SEMIDEC® Galvanized ducts are supplied in 3 m lengths, compressed.
Compressed ducts to be extended with:
≤ Ø 200mm – 2 Persons
> Ø 200mm – 4 persons
By stretching always use gloves en safety goggles!!

Other lengths and different packages are available on request.

	SEMIDEC® Galvanized
Mechanical properties	
Temperature range (°C)	-30 - +375
Melting point Galvanized layer (°C)	< 420
Melting point steel (°C)	1535
Max. operating pressure (Pa)	+3000
Max. air velocity (m/s)	30
Diameter range (mm)	080 - 500
Technical Data	
Article code	DSDX(80){Ø}
Material Construction	1 Layer Galvanized steel
Minimum bending radius	1 x Ø
Standard length (meters)	3

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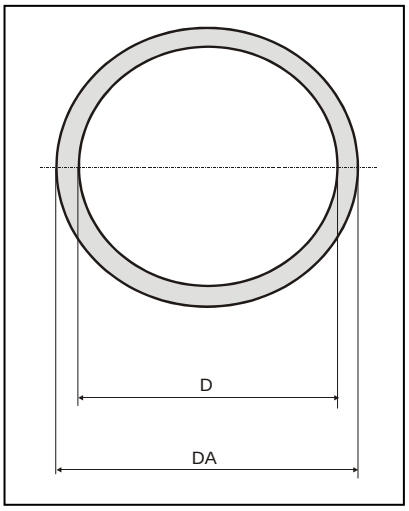
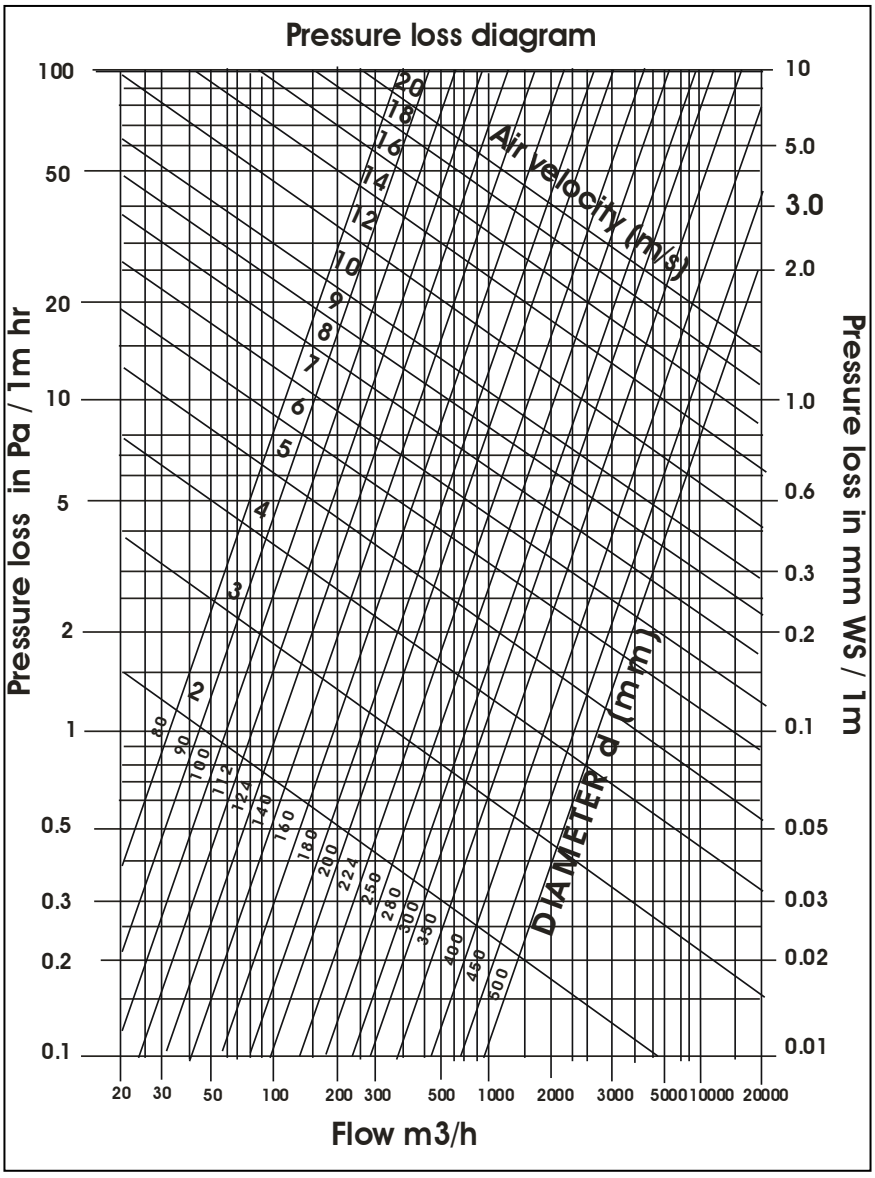
1.044 SEMIDEC® Galvanized

Corrugated steel ducting

D(mm)	Tolerance	DA (mm)
080	+1,0 / -0	087
100	+1,0 / -0	107
125	+1,0 / -0	132
150	+1,5 / -0	157
160	+1,5 / -0	167
180	+1,5 / -0	187
200	+1,5 / -0	207
224	+1,5 / -0	231
250	+2,0 / -0	257
280	+2,0 / -0	287
300	+2,0 / -0	307
315	+2,0 / -0	322
355	+2,0 / -0	402
400	+2,0 / -0	407
450	+2,0 / -0	457
500	+2,0 / -0	507





Please Notice
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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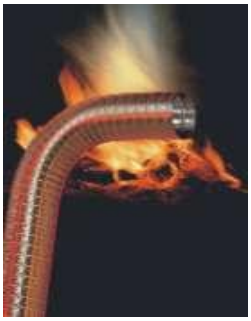
1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Product information for customers
If you decide using a flexible system, please be sure you select the correct type of chimney lining. The diameter is stipulated by the total length, including the connections and course of the tube lining, the capacity, the type of appliance and the fuel.
The choice of system is depending of the used appliance and the national standards and building regulations.

The Decflex tube lining material is an universalsystem with EC, KOMO, GastecQA and NF221 standards and is suitable for over-en underpressure applications within wet or dry circumstances.

The **DECFLEX** range can be divided into three main groups:
- Single-walled products.
- Double-walled products. (inside smooth)
- Accessories.

Product name:	**DECFLEX SWE/316 L**
Product code:	**D1BYE {Ø} L**
Material:	Austenitic stainless steel (AISI 316L / DIN 1.4435)
Application:	In situations where no special provisions for condensation are required
Product name:	**DECFLEX SW/316 Ti**
Product code:	**D2BY {Ø} L**
Material:	Austenitic stainless steel (AISI 316Ti / DIN 1.4571)
Application:	In situations where no special provisions for condensation are required
Wall properties: Corrugated	



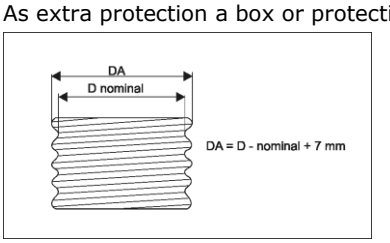
DOUBLE-WALLED WITH TRIPLE LOCKSEAM	
Product name:	**DECFLEX TW/316Ti**/DIN 1.4571
Product code:	**D22BY {Ø} L**
Material:	Austenitic stainless steel (AISI 316Ti/DIN 1.4571)
Application:	In situations where no special provisions for condensation are required
Wall properties: outside cover corrugated, inside smooth	

- Material is in all the above Cold Rolled Bright Annealed (tested according to EN 10204 3.1B)

Description of the production process
The production process is certified according to:
- **EN-ISO9001: 2000** by Bureau Veritas (**BVQI**).
- **EN 1856-2** with **F**actory**P**roduction**C**ontrol (FPC) per product by **CSTB.**

All flexible tubes have been marked at least every three metres with:
- Product name,
- Production date with ordernumber,
- nominal measurements,
- batch numbers and
- hallmark(s).
- A line marks every metre.

Packaging
The flexible tubing comes standard in easy rolls covered with polyethylene elastic foil to minimise packaging waste. As extra protection a box or protection foil can be used.



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1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Single-walled						
Load	**Diameter**	**D2BY and D3BY**				
Nett [kW]	Ø nom [mm]	wood min. max. L in metres	oil min. max. L in metres	Zeta	Bending radius min (mm)	Kg/m
5	080	5 – 5	3 – 5	0.72	240	0.50
10	080	X	X	0.72	240	0.50
5	090	3 – 6	2 - 5	0.61	270	0.56
10	090	X	5	0.61	270	0.56
5	100	3 - 5	2 - 4	0.53	300	0.62
10	100	6 - 9	3 - 7	0.53	300	0.62
7.5	110	3 - 7	2 - 6	0.47	330	0.68
15	110	11 - 12	4 - 10	0.47	330	0.68
7.5	120	2 - 7	2 - 6	0.41	360	0.74
15	120	6 - 11	3 - 9	0.41	360	0.74
7.5	125	2 - 6	2 - 5	0.39	375	0.77
15	125	5 - 11	3 - 9	0.39	375	0.77
10	130	3 - 8	2 - 7	0.37	390	0.81
20	130	7 - 13	4 - 11	0.37	390	0.81
15	140	3 - 11	2 - 9	0.34	420	0.87
30	140	16 - 18	5 - 15	0.34	420	0.87
15	150	2 – 10	2 – 9	0.31	450	0.93
30	150	7 – 17	3 – 14	0.31	450	0.93
15	160	2 – 10	2 – 10	0.28	480	0.99
30	160	5 – 17	3 – 14	0.28	480	0.99
20	180	2 - 12	2 - 10	0.24	540	1.11
40	180	6 - 20	3 - 16	0.24	540	1.11
25	200	2 - 13	2 - 11	0.21	600	1.24
50	200	5 - 22	3 - 18	0.21	600	1.24
35	225	2 - 16	2 - 14	0.17	675	1.39
70	225	6 - 27	3 - 23	0.17	675	1.39
40	250	2 - 17	2 - 14	0.16	750	1.55
80	250	5 - 29	3 - 24	0.16	750	1.55
55	300	2 - 20	2 - 17	0.12	900	1.86
110	300	4 - 34	3 - 28	0.12	900	1.86
80	350	2 - 25	2 - 21	0.10	1050	2.17
160	350	5 - 42	3 - 35	0.10	1050	2.17

Double-walled						
Load	**Diameter**	**D22BY and D33BY**				
Nett [kW]	Ø nom [mm]	wood min. max. L in metres	oil min. max. L in metres	Zeta	Bending radius min (mm)	Kg/m
5	100	2 - 6	2 - 5	0.38	300	0.93
10	100	5 - 10	3 - 8	0.38	300	0.93
7.5	110	3 - 8	2 - 7	0.34	330	1.02
15	110	7 - 13	4 - 11	0.34	330	1.02
7.5	120	2 - 8	2 - 6	0.30	360	1.11
15	120	5 - 13	3 - 11	0.30	360	1.11
7.5	125	2 - 7	2 - 6	0.29	375	1.16
15	125	4 - 12	3 - 11	0.29	375	1.16
10	130	2 - 9	2 - 8	0.27	390	1.21
20	130	5 - 15	3 - 13	0.27	390	1.21
15	140	3 - 12	2 - 10	0.25	420	1.30
30	140	9 - 20	4 - 17	0.25	420	1.30
15	150	2 – 12	2 - 10	0.23	450	1.39
30	150	6 – 19	3 - 16	0.23	450	1.39
15	160	2 – 13	2 - 11	0.21	480	1.48
30	160	4 – 19	3 - 16	0.21	480	1.48
20	180	2 - 13	2 - 11	0.18	540	1.67
40	180	5 - 22	3 - 19	0.18	540	1.67
25	200	2 - 15	2 - 13	0.16	600	1.85
50	200	5 - 25	3 - 21	0.16	600	1.85
35	225	2 - 18	2 - 15	0.14	675	2.00
70	225	5 - 30	3 - 26	0.14	675	2.00
40	250	2 - 19	2 - 17	0.12	750	2.32
80	250	5 - 32	3 - 28	0.12	750	2.32
55	300	2 - 23	2 - 20	0.09	900	2.78
110	300	4 - 38	3 - 33	0.09	900	2.78
80	350	2 - 29	2 - 24	0.08	1050	3.29
160	350	4 - 47	3 - 40	0.08	1050	3.29

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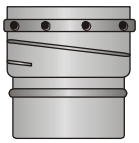
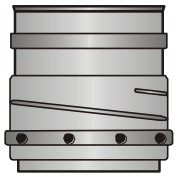
1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

ACCESSORIES:

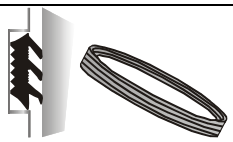


ADAP1-PW {Ø}	Connecting piece/Flex
Material thickness: 0.5 mm	Stainless steel 316L/DIN 1.4404
Available diameters (mm): 080, 090, 100, 113, 125, 130, 150, 180, 200.	

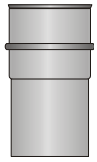


ADAP2-PW {Ø}	Flex/Connecting piece
Material thickness: 0.5 mm	Stainless steel 316L/DIN 1.4404
Available diameters (mm): 080, 090, 100, 113, 125, 130, 150, 180, 200.	

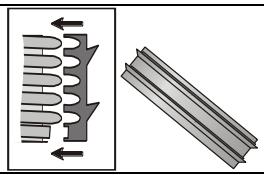
HT kit	Sealingkit for ADAPPW
Maximum temperature combustion gases 200°C	High temperature Silicone sealant kit
Tube of 310ml	



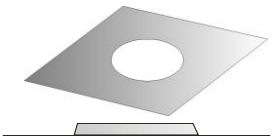
ADAS3 {Ø}	Sealing ring for ADAP2PW female side
Maximum temperature combustion gases 200°C	Silicone rubber
Available diameters (mm): 080, 100, 113, 130, 150, 180, 200.	



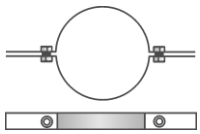
ADAP 2 {Ø}	Flex/Connecting piece
Material thickness: 0.5 mm	Stainless steel 316L/DIN 1.4404
Available diameters (mm): 080, 090, 100, 125, 130, 150, 180, 200, 225, 250, 300	



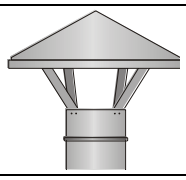
ADAS1 {Ø}	Sealing ring for ADAP1R(G)
Maximum temperature combustion gases 250°C	Silicone rubber
Available diameters (mm): 080, 90, 100, 110, 130, 150.	



ADAP3 {Ø}	Cover plate for ADAP2
Material thickness: 0.5 mm	Stainless steel 316L/DIN 1.4404
Available diameters (mm): 080, 090, 100, 125, 130, 150, 180, 200, 225, 250, 300	



FLS 316Ti {Ø}	Mounting bracket
Material thickness: 2.0 mm	Stainless steel 316Ti/ 1.4571
Available diameters (mm): 080, 090, 100, 125, 130, 150, 180, 200, 250, 300	



FLRC {Ø}	Raincap
Material thickness 0.6 mm	Stainless steel 316L/ 1.4404
Available diameters (mm):: 080, 100, 110, 130, 150, 180, 200.	

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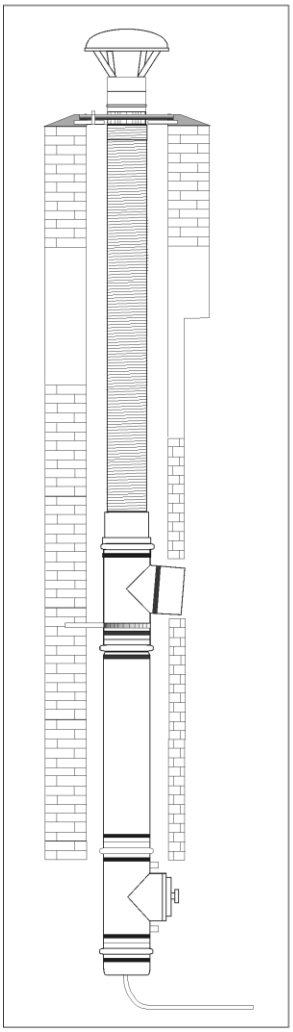
1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

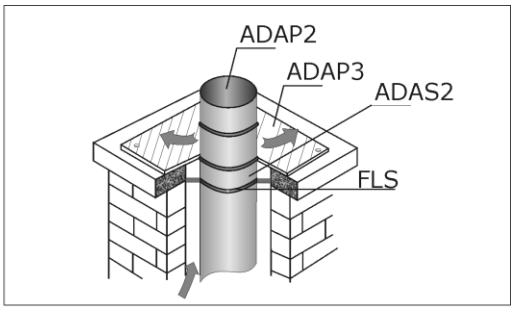
ACCESSORIES:

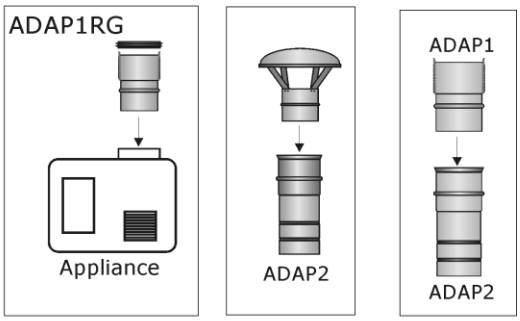
FLRC1 {Ø}	Raincap with clamp
Material thickness 0.6 mm	Stainless steel 316L/ 1.4404
Available diameters (mm):: 080, 100, 110, 130, 150, 180, 200.	

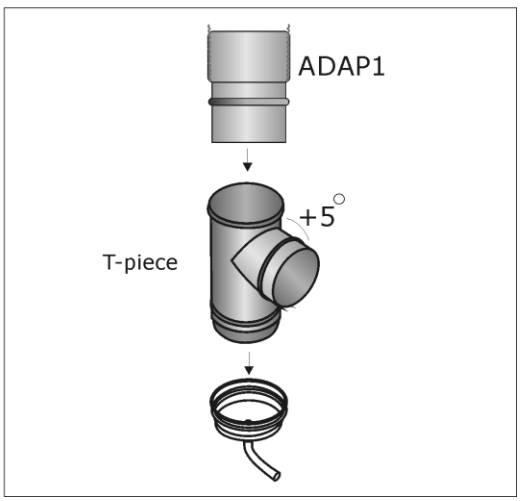
FLCR1 {Ø}	Clamping bracket
Material thickness: 0.6 mm	Stainless steel 316/ 1.4401
Available for diameters (mm): 080, 100, 110, 130, 150, 180, 200.	

Sample situations (illustrations serve as examples only). The manufacturer accepts no liability for the ultimate construction.









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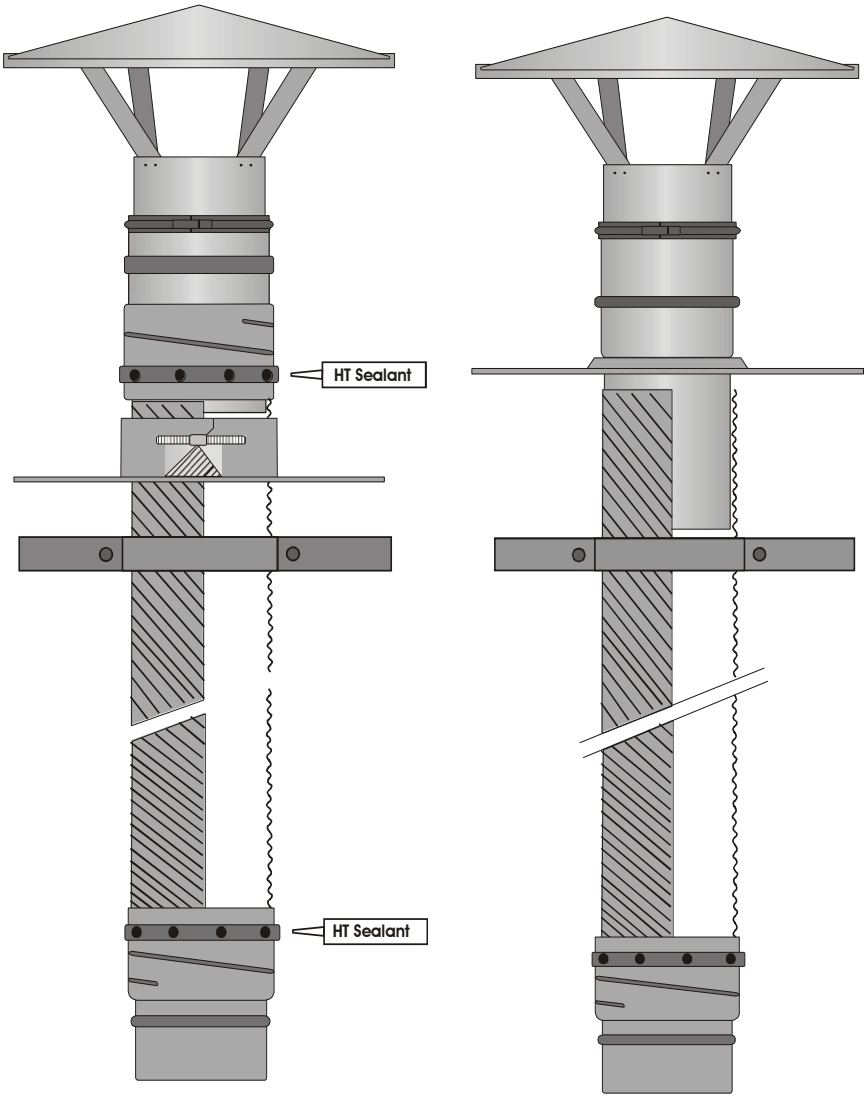
1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Sample situations (illustrations serve as examples only). The manufacturer accepts no liability for the ultimate construction.

Overpressure systems **Underpressure systems**



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1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Installation manual for DECFLEX flexible chimney tube lining

Contents

Manufacturer

Dutch Environment Corporation® B.V.
BVQI certified in accordance with **NEN-ISO 9001:2000**.
CSTB certified in accordance with **EN 1856-2:2004 (CE)**

Products

The **DECFLEX** range can be divided into three main groups:
- Single-walled products
- Twin-walled products with a smooth inside
- Accessories

Both the single-walled and the twin-walled flexible chimney linings are available in two stainless steel qualities:
AISI 316L / 1.4435 and AISI 316Ti / 1.4571 .
A range of accessories is available for a correct assembly in the flue, the exhaust hood assembly and for connecting the device. Please refer to the technical specifications for further details on these products.

Application

Flexible tube lining is applied in an existing chimney for discharging combustion gases.
The flexible lining may not be seen as repairs to a chimney that is in a poor condition. The existing chimney must be in good condition and built in accordance with current standards and regulations.
Application of the lining will result into:
- A smaller diameter than the original channel;
- Protecting the original flue against the risks of condensation and affecting of the inside of the chimney;
- Improved gas tightness.

Please note: DEC International® accept absolutely no liability for an injudicious or wrong assembly, nor for a wrongly chosen application of here defined products.
Single-walled products may generally be used for exhausting flue gas from gas-fired appliances.
The twin-walled products have a far smoother inside and therefore a lower resistance. These twin-walled products are suitable as chimney linings. Twin walls also have a longer lifespan.
Arrows on the outside of the twin-walled tubing show the flow direction of combustion gases.

®KOMO and Gastec QA

Above mentioned marks only affect the below mentioned products:
KOMO® : D22BY, D33BY, D2BY and D3BY
GASTEC QA : D2BY en D3BY

[1)]The **®KOMO** label has been granted for a number of different applications.
This version is suitable for dry exhaust systems, operating with underpressure
and a maximum flue gas temperature of 600°C. Characterisation: **T600/1000-N-D.** Appliances such as open fire places, closable wood and coal-burning heaters and oil-fired central heating boilers are suitable for connecting to these exhaust systems. Both the single-wall and the double-wall flexible tube lining can be used with the systems. Certificate number G16/01 applies to the entire diameter range.

[2)]The use of sealing rings between the flexible liners and the adapters allows the exhaust systems to be used with overpressure but because of these sealing rings the flue gas temperature must not exceed 200°C.
The overpressure version has a characterisation of **T200-P-W WITH SEALING RING** and comes under certificate number G16/01 **®KOMO** label (non-gas appliances). The tube lining is available in single-wall as well as double-wall versions and for diameters of up to 200 mm.

[3)]The overpressure version is also suitable for gas-fired appliances. **®KOMO** certificate number G19/02 applies to this version and has the same characterisation: **T200-P-W WITH SEALING RING**. The tube lining is available in single-wall as well as double-wall versions and for diameters of up to 200 mm. Certificate number 01/002 applies to the **GASTEC QA** label for overpressure with the following characterisation: **T250-P-W**. **GASTEC QA** applies to single-wall flexible tube lining for diameters: 080, 090, 100, 110, 120, 130, 140 and 150 mm.
In the case of condensation we recommend the use of 904L quality stainless steel.

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1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

CE Marking EN 1856-2
Chimneys – Requirements for metal chimneys- Part2: Metal liners and connecting flue pipes

Above mentioned European Standard affects the complete **Decflex** range.

As from April 1, 2006 all flexible metal flue liners must comply with the European standard 1856-2 and bear the corresponding **CE**-marking. This standard is in force in all European countries, and replaces identical national standards. The advantage is more transparency for all parties: the chimney systems now are clearly marked with a classification that indicates for what purpose the product can be applied.

Regarding the installation the national building regulations remain in force.

All **DECFLEX** products comply with the European norm, and starting **August 1. 2005** the **DECFLEX** range will be marked **CE** with the corresponding designation.

From the **DECFLEX**-range, the complete **CE-declaration of conformity** and **FPC-certificates** are available upon request.
For all additional information, please contact our sales department.

The declared maximum designations are:

DecflexTW - 316Ti	EN1856-2 T200 - P1 - W -Vm - L50012 - O
	EN1856-2 T450 - N1 - D -Vm - L50012 - G
DecflexSW - 316Ti	EN1856-2 T200 - P1 - W- Vm - L50012 - O
	EN1856-2 T450 - N1 - D -Vm - L50012 - G
DecflexSWE - 316L	EN1856-2 T200 - P1 - W -Vm - L50012 - O
	EN1856-2 T450 - N1 - D -Vm - L50012 - G

Preparation

Please read the following information before installation:

Do NOT use these products for halogen-contaminated exhaust gases!

Use the flexible tubing only as lining in an existing chimney flue for discharging combustion gases. Check that the chimney is not damaged or cracked as the structural strength could be reduced.

Establish that the required system is a negative or positive pressure system. Find out whether or not condensation may occur. Choose the quality of the materials and necessary components accordingly.

The flexible duct cannot be used horizontally. The maximum angle relative to the plumb line is 30° for heavy condensing appliances and 45° for moderately condensing appliances and dry systems.

Ensure the chimney has been carefully swept before installation. Residual deposits may affect the lining.

Check that the existing chimney complies with building regulations. Generally the existing chimney will discharge in a free-flow area with no need for a chimney aspirator. The installation of a rain cap is recommended. If necessary, please check NEN 2757 or NPR 2758 or the applicable norms of your country .

In dwellings with combustible roofing (e.g. thatched houses) the exhaust hood must be fitted with a spark catcher. Check the small print of your insurance policy.

Flexible linings with a diameter smaller than 120 mm may not be used for gas-fired appliances exceeding a nominal output of 60kW. Check with the appliance manufacturer that the use of a stainless steel flexible flue gas exhaust system is allowed.

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1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Length and diameter

When checking that the required length and diameter are in order, we make a distinction between:

- Overpressure systems for appliances fitted with a fan, and

- Underpressure systems for appliances running on natural discharge.

Overpressure system

The loss of pressure is calculated with the formula $\Delta p = (\cdot \zeta_p + \zeta_v \cdot \frac{1}{2} \cdot \rho \cdot v_{nom}^2$ in which

L = Total length of the flexible lining [m]

ζ_p = Resistance factor (zeta). This is mentioned for the flexible tubes in the technical specifications

ζ_v = Resistance factor (zeta) if the exhaust system has a slope angle the zeta value must be increased as follows:

Slope angle (2 curves)	Zeta increase
30°	0.24
45°	0.36

ρ = Density of the combustion gases in [kg/m^3];

V_{nom} = Velocity of the combustion gases in de nominal tube diameter [m/s].

To be calculated from the quantity of combustion gases to be discharged. For mounting the installation instruction of the appliance manufacturer should be consulted.

The calculated pressure loss of the diameter to be applied must be lower than the allowed pressure loss according to the installation instructions of the appliance.

Underpressure system

Follow the directions by the appliance manufacturer for the lining diameter. In general the lining will need the same diameter as used for the appliance-connecting sleeve.

The proper operation of the appliance not only depends on the diameter but also on the length, both the minimum and the maximum length.

The following table shows the minimum and maximum exhaust lengths.
These details are based on the following assumptions:

- An exhaust system with two 30° curves;
- Necessary draw for proper operation is 5 Pa (including the exhaust entry resistance);
- CO2 content of the flue gases is 8%
- Temperature of the flue gases is 200 °C;

The allowed length depends on the exhaust system diameter and the load of the appliance. When knowing the length and the diameter one can also see which load can be applied. Of course one could also work out the right diameter once the length and the load are known.

The minimum length is needed for transporting the combustion gases. The draw must exceed the resistance of the exhaust system.

Condensation may occur when the tubing is too long. The lining itself may be condense water resistant, certainly if stainless steel 904L has been applied, but the proper operation of the appliance at the start may be adversely affected if combustion gases are cooling off too much. Using twin-walled lining can eliminate condensation problems; by insulating the cavity.

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1.050 DECFLEX FLEXIBLE CHIMNEY TUBE LINING

Minimum and maximum length in metres for:					
Load	Diameter	D2BY	D22BY	D2BY	D22BY
o.w. [kW]	[mm]	s.w./wood	t.w./wood	s.w./oil	t.w./oil
5	080	5 – 5	5 – 5	3 – 5	3 - 5
10	080	X	X	X	8 - 9
5	090	3 – 6	3 – 7	2 - 5	2 - 5
10	090	X	X	5	8
5	100	3 - 5	2 - 6	2 - 4	2 - 5
10	100	6 - 9	5 - 10	3 - 7	3 - 8
7.5	110	3 - 7	3 - 8	2 - 6	2 - 7
15	110	11 - 12	7 - 13	4 - 10	4 - 11
7.5	120	2 - 7	2 - 8	2 - 6	2 - 6
15	120	6 - 11	5 - 13	3 - 9	3 - 11
7.5	125	2 - 6	2 - 7	2 - 5	2 - 6
15	125	5 - 11	4 - 12	3 - 9	3 - 11
10	130	3 - 8	2 - 9	2 - 7	2 - 8
20	130	7 - 13	5 - 15	4 - 11	3 - 13
15	140	3 - 11	3 - 12	2 - 9	2 - 10
30	140	16 - 18	9 - 20	5 - 15	4 - 17
15	150	2 – 10	2 – 12	2 – 9	2 - 10
30	150	7 – 17	6 – 19	3 – 14	3 - 16
15	160	2 – 10	2 – 13	2 – 10	2 - 11
30	160	5 – 17	4 – 19	3 – 14	3 - 16
20	180	2 - 12	2 - 13	2 - 10	2 - 11
40	180	6 - 20	5 - 22	3 - 16	3 - 19
25	200	2 - 13	2 - 15	2 - 11	2 - 13
50	200	5 - 22	5 - 25	3 - 18	3 - 21
35	230	2 - 16	2 - 18	2 - 14	2 - 15
70	230	6 - 27	5 - 30	3 - 23	3 - 26
40	250	2 - 17	2 - 19	2 - 14	2 - 17
80	250	5 - 29	5 - 32	3 - 24	3 - 28
55	300	2 - 20	2 - 23	2 - 17	2 - 20
110	300	4 - 34	4 - 38	3 - 28	3 - 33
80	350	2 - 25	2 - 29	2 - 21	2 - 24
160	350	5 - 42	4 - 47	3 - 35	3 - 40

s.w = Single-walled
t.w. = Twin-walled

"x" in the tables stands for no dry chimney with sufficient capacity

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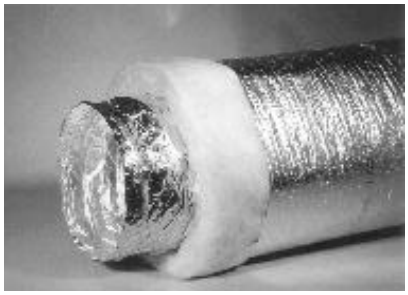
1.060 ISODEC® THERMAL INSULATED DUCTING

DEC International® produces different thermically insulated products for several purposes. The thermic insulation is suitable for preventing condensation and minimizing heat loss and loss of cold.

The **ISODEC®** series consists of an aluminium laminate inner duct, thermically insulated with a glass wool layer and provided with an either glass fibre strengthened outer jacket.



Application in practice
- Insulation in ventilation and air supply systems
- Air conditioning systems
- Thermic insulation in order to prevent heat loss or loss of cold
- Preventing of condensation in ventilation systems

	ISODEC® 25	ISODEC® 250	ISODEC® 250 CE
Mechanical properties			
Temp. range (°C) Inner duct Outer duct	-30 -+140 -30 -+140	-30 -+250 -30 -+140	-30 -+250 -30 -+140
Maximum operating pressure (Pa)	+2500	+3000	+3000
Maximum air velocity (m/s)	25	30	30
Diameter range (mm)	82 - 508	65 - 635	102 - 508
Fire classes according to			
Europe (EN 13502-1)	B-s1, d0	B-s1, d0	x
The Netherlands (NEN 6065/6066)	1	1	x
Germany (DIN 4102)	B2	B1	x
France (CSTB)	M1	M0/M1	M0/M1
Switzerland (BKZ)	x	5.3	x
United Kingdom (BS 476)	6, 7 and 20	6, 7 and 20	x
Austria (B3800)	B1	B1	x
Italy (CSI)	1-0	1-0	x
Technical data			
Article code	DI{Ø}	DIX{Ø}	DIXCE{Ø}
Material structure/ Construction	see product specific properties		
Wire spacing inner duct: - upto Ø102 mm - Ø102 mm and larger	25 mm 36 mm	25 mm 18 mm[2)]	- 36 mm
Minimum bending radius	0.54 x Ø + ↕	0.58 x Ø + ↕	0.54 x Ø + ↕
Standard length (meters)	10	10	10
Standard color	aluminium	aluminium	aluminium

X = not been tested - ↕ = thickness of glass wool - [2)] = two different wires have been used alternately

Product specific properties ISODEC®
The **ISODEC®** is also available, on request, with a 50 mm glass wool layer, the article number is: DI(X)50{Ø}
- Material structure: - aluminium laminate / glass wool / aluminium laminate.
- Construction: - inner duct : aluminum, polyester laminate.
  - glass wool blanket : 25 (or 50) mm, 16 kg/m^3.
  - outer jacket : aluminum, polyester laminate.
- R-value glass wool: 0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76).

The **ISODEC®** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork-Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **ISODEC®** ducts are not suitable for transporting air with a high concentration of acid and base. Neither are the **ISODEC®** ducts suitable for discharging combustion gases.
PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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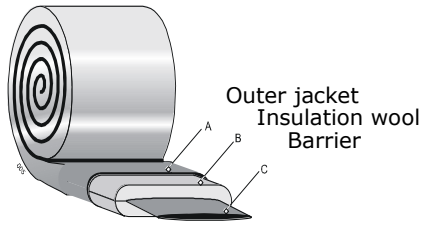
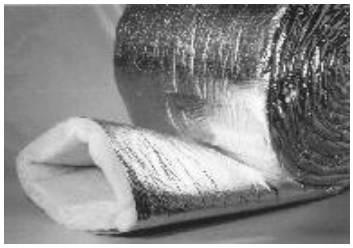
1.061 ISOSLEEVE THERMAL INSULATED DUCTING

DEC International® produces different thermically insulated products for several purposes. The thermic insulation is suitable for preventing condensation and minimizing heat loss and loss of cold.

The **ISOSLEEVE** consists of an aluminium laminate outer jacket, strengthened with glass fibre and provided with a glass wool insulation layer.

Application in practice
- Insulation in air supply systems
- Air conditioning systems
- Insulation of rainwater discharge
- Reducing of heat loss
- Preventing/discharging of condensation



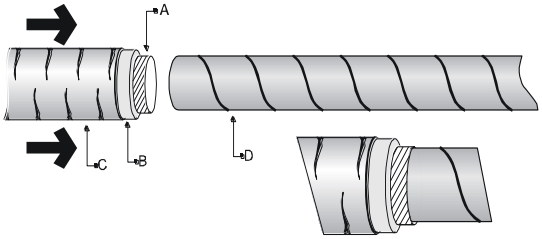


	ISOSLEEVE 25	ISOSLEEVE 50
Mechanical properties		
Temperature range (°C)	-30 - +140	-30 - +140
Maximum operating pressure (Pa)	+2000	+2000
Maximum air velocity (m/s)	irrelevant	irrelevant
Diameter range (mm)	52 - 635 [1)]	52 - 635 [1)]
Fire classes according to		
Europe (EN 13501-1)	B-s1, d0	B-s1, d0
The Netherlands (NEN 6065/6066)	3-1	3-1
France (CSTB)	M1	M1
Technical data		
Article code	DHB{Ø}	DHB50{Ø}
Material structure / Construction	see product specific properties	
Standard length (meters)	10	10
Standard color	aluminium	Aluminium

X=Not been tested - [1)] =Diameter acc. to inner duct

Product specific properties.
ISOSLEEVE 25/50
- Material structure: - polyester laminate / glass wool / aluminum laminate
- Construction: - inner film : closed polyester film
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3
  - Outer jacket : aluminum, polyester laminate
- R value glass wool: - 0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76)

Barrier
The **ISOSLEEVE 25** (and **50**) has standard a barrier. The barrier simplifies the mounting, and the installer will not have unnecessary contact with the glass wool.
The article numbers for the **ISOSLEEVE 25** and **50** with barrier are resp. **DHB{Ø}** and **DHB50{Ø}**.



A. Barrier
B. Insulation wool
C. Outer duct
D. Rigid channel

Restrictions in the range of application
The **ISOSLEEVE 25** (or **50**) is not suitable in rooms with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
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1.060 Semidec®250 THERMAL/ACOUSTICAL INSULATED DUCTING

Semidec® 250 is a thermical or acoustic insulated flexible duct constructed of one layer of corrugated aluminum, insulated with 25mm Insulation wool and an aluminium laminated outer jacket. By the lock seam of the inner duct a high air tightness and flexibility is reached. The duct is fitted with 2 plastic clamps on the ends before compressing to packaging length (±80 cm).

Application in practice
- Insulation in ventilation and air supply systems
- Air conditioning systems
- Thermic insulation in order to prevent heat loss or loss of cold
- Preventing of condensation in ventilation systems

	Semidec 250 I	Semidec 250 S
Mechanical properties		
Temp. range (°C) Inner duct Outer duct	-30 -+250 -30 -+140	-30 -+250 -30 -+140
Maximum operating pressure (Pa)	+3000	+3000
Maximum air velocity (m/s)	30	30
Diameter range (mm)	100 - 315	100 - 315
Technical data		
Article code	DXDIM{Ø}	DXDSM{Ø}
Material structure/ Construction	see product specific properties	
Minimum bending radius	1 x Ø + ↕	1 x Ø + ↕
Standard length (meters)	3	3
Standard color	aluminium	aluminium

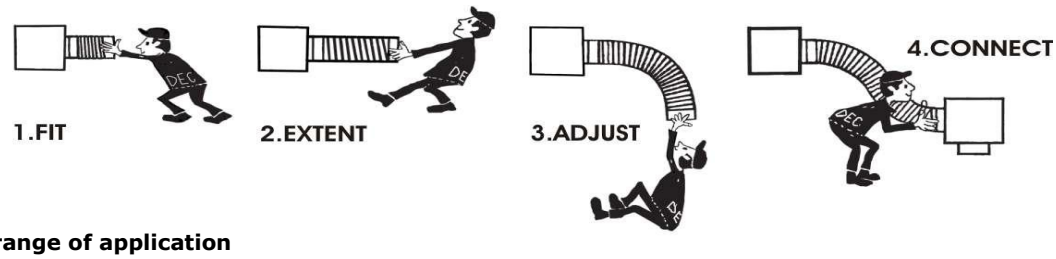
↕ = thickness of glass wool

Product specific properties Semidec® 250 I (Thermal Insulated)
- Material structure: - Corrugated aluminium / glass wool / aluminium laminate.
- Construction: - Inner duct : aluminum.
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3.
  - Outer jacket : aluminum, polyester laminate.
- R-value glass wool: 0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76).

Product specific properties Semidec® 250 S (Thermal/Acoustical Insulated)
- Material structure: - Corrugated perforated aluminium / glass wool / aluminium laminate.
- Construction: - Inner duct : aluminum.
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3.
  - Outer jacket : aluminum, polyester laminate.
- R-value glass wool: 0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76).

The **Semidec® 250** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork-Dimensions and mechanical requirements for flexible ducts*"

HOW TO INSTALL



Restrictions in the range of application
The **Semidec® 250** ducts are not suitable for transporting air with a high concentration of acid and base.
Neither are the **Semidec® 250** ducts suitable for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.063 ISODEC® 18
THERMAL INSULATED DUCTING

The **ISODEC®** series consists of an aluminium laminate inner duct, thermally insulated with a glass wool layer and provided with an laminated outer jacket. The thermal insulation is suitable for preventing condensation and minimizing heat loss and loss of cold.

Application in practice
- Insulation in ventilation and air supply systems
- Air conditioning systems
- Thermal insulation in order to prevent heat loss or loss of cold
- Preventing of condensation in ventilation systems

	ISODEC® 18
Mechanical properties	
Temp. range (°C) Inner duct Outer duct	-30 -+140 -30 -+140
Maximum operating pressure (Pa)	+2500
Maximum air velocity (m/s)	25
Diameter range (mm)	82 - 508
Technical data	
Article code	DEC18{Ø}
Material structure/ Construction	see product specific properties
Minimum bending radius	1 x Ø + ↕
Standard length (meters)	10
Standard color	aluminium

↕ = thickness of glass wool

Product specific properties ISODEC® 18
The **ISODEC®** 18is also available, on request, with a 50 mm glass wool layer, the article number is: DEC18{Ø}
- Material structure: - Black polyester laminate / glass wool / aluminized polyester laminate.
- Construction: - Inner duct : Black polyester laminate.
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3.
  - Outer jacket : Aluminized polyester laminate.
- R-value glass wool : R = 0.726 (25 mm), k = 0.039 m^2K/W (ASTM C177-76) R = 1.45(50mm)

The **ISODEC®** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork-Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **ISODEC®** ducts are not suitable for transporting air with a high concentration of acid and base. Neither are the **ISODEC®** ducts suitable for discharging combustion gases.
PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.064 ISODEC®2500 THERMAL INSULATED DUCTING

The **SONODEC® 2500** consists of a aluminum laminate inner duct, thermically insulated with a glass wool layer and provided with an aluminum laminate outer duct.

Application in practice
- Insulation in ventilation and air supply systems
- Air conditioning systems
- Thermic insulation in order to prevent heat loss or loss of cold
- Preventing of condensation in ventilation systems

	ISODEC®2500
Mechanical properties	
Temperature range (°C) inner duct outer duct	-30 - +250 -30 - +250
Maximum operating pressure (Pa)	+2500
Maximum air velocity (m/s)	30
Diameter range (mm)	65 - 635
Fire classes according to	
Europe (EN13501-1)	A2,s1
The Netherlands (NEN 6065/6066)	1
Germany (DIN 4102)	B1
France (CSTB)	M0/M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	6, 7 and 20
Austria (B3800)	x
Technical data	
Article code	DIY{Ø}/Length
Material structure / Construction	see product specific properties
Wire spacing inner duct -upto Ø 102 - Ø 102 and larger	25 mm 18[1)]mm
Minimal bending radius	0.58 x Ø + ↕
Standard length (meters)	10
Standard color	aluminium

↕ = thickness of the glass wool
1) = two different wires have been used alternately

Product specific properties
The **ISODEC® 2500** is also available, on request, with a 50 mm glass wool layer, the article number is: DIY50{Ø}
- Material structure: : aluminum laminate / glass wool / aluminum laminate
- Construction: - inner duct :aluminum, polyester laminate
  - glass wool blanket :25 (or 50) mm, 16 kg/m^3
  - outer jacket :aluminum, polyester laminate
- R-value glass wool :0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76)

The **ISODEC®** fulfills all the requirements and are classified as specified within:
EN 13180 :"*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of applications
The **ISODEC®** ducts are not suitable for transporting air with a high concentration of acid and base.
Neither are the **ISODEC®** ducts suitable for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.065 ISODEC® CLASSIC Thermal insulated ducting

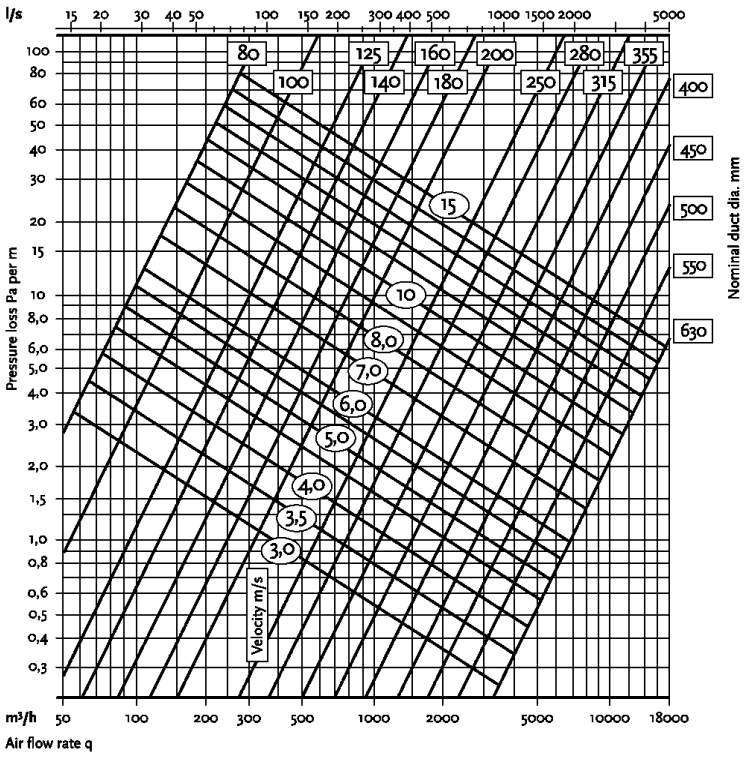
Fully flexible, economic, pre-insulated ducting with an inner core constructed from multiple layers of aluminum and polyester laminated to encapsulate a high carbon, spring steel wire helix. The inner core is wrapped with a thick blanket of insulation and covered with an outer vapor barrier constructed from multiple layers of aluminized polyester and polyester.
ISODEC CLASSIC installs easily on circular or oval fittings.
ISODEC CLASSIC insulated flexible ducting is used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

Specifications
Insulation 25mm thick: R = 0.69 [$m^2 \cdot K/W$]
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 82mm to 560mm
Standard Length - 10 meter

Classifications
French - M1
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 1.0 mtr.

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- Reduced labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling cost

Use Limitations

ISODEC CLASSIC is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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1.066 GREYDEC®2500 THERMAL INSULATED DUCTING

The **GREYDEC® 2500** consists of a polyester fabric inner duct, thermically insulated with a glass wool layer and provided with a polyester fabric outer duct.

Application in practice
- Insulation in ventilation and air supply systems
- Air conditioning systems
- Thermic insulation in order to prevent heat loss or loss of cold
- Preventing of condensation in ventilation systems

		GREYDEC®2500
Mechanical properties		
Temperature range (°C)	inner duct outer duct	-30 - +80 -30 - +80
Maximum operating pressure (Pa)		+3000
Maximum air velocity (m/s)		30
Diameter range (mm)		102 - 508
Fire classes according to		
Germany (DIN 4102)		x
France (CSTB)		x
Switzerland (BKZ)		x
United Kingdom (BS 476)		6, 7 and 20
Austria (B3800)		x
Technical data		
Article code		DGY{Ø}/Length
Material structure / Construction		see product specific properties
Wire spacing	Ø 76 - 90 mm Ø 102 - 120 mm Ø 125 - 406 mm Ø 457 and larger	25 mm 36 mm 36 mm
Minimal bending radius		0.56 x Ø + ↕
Standard length (meters)		10
Standard color		aluminium

↕ = thickness of the glass wool

Product specific properties
The **ISODEC® 2500** is also available, on request, with a 50 mm glass wool layer, the article number is: DGY50{Ø}
- Material structure: : polyester fabric / glass wool / polyester fabric
- Construction: - inner duct : polyester fabric
  - glass wool blanket :25 (or 50) mm, 16 kg/m^3
  - outer jacket : polyester fabric
- R-value glass wool :0.69 (25 mm) or 1.4 (50 mm) m^2K/W (ASTM C177-76)

The **GREYDEC®** fulfills all the requirements and are classified as specified within:
EN 13180 :"*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of applications
The **GREYDEC®** ducts are not suitable for transporting air with a high concentration of acid and base.
Neither are the **GREYDEC®** ducts suitable for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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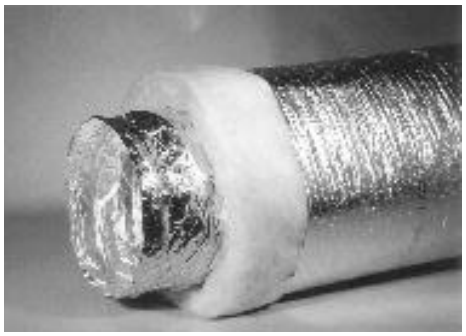
1.067 ALPHAFLEX ISO Thermal insulated ducting

Fully flexible, economic, pre-insulated ducting with an inner core constructed from multiple layers of aluminum and polyester laminated to encapsulate a high carbon, spring steel wire helix. The inner core is wrapped with a thick blanket of insulation and covered with an outer vapor barrier constructed from multiple layers of aluminized polyester and polyester.
ALPHAFLEX ISO installs easily on circular or oval fittings.
ALPHAFLEX ISO insulated flexible ducting is used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

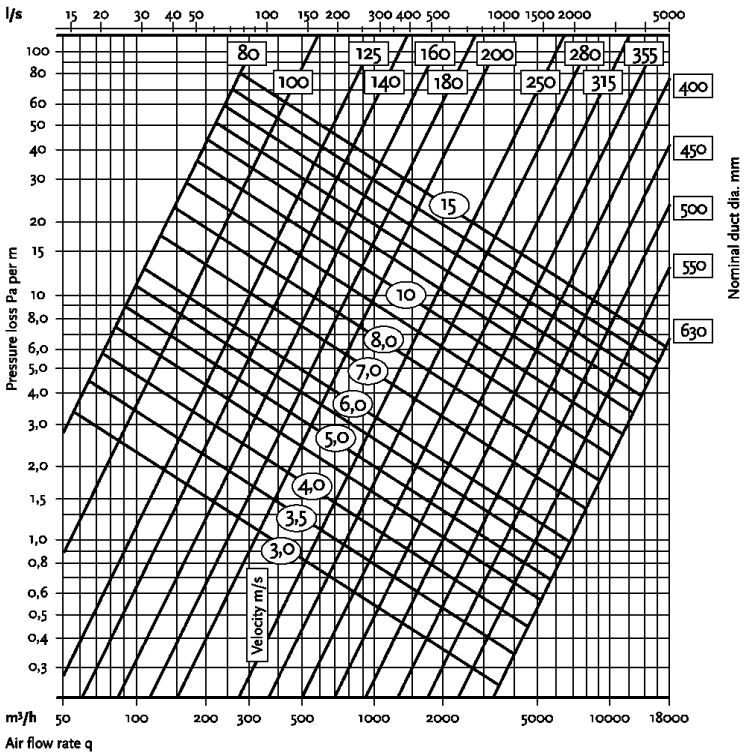


Specifications
Insulation 25mm thick: R = 0.69 [$m^2 \cdot K/W$]
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 102mm to 406mm
Standard Length - 10 meter

Classifications
EU - EN 13501/1: CE - B,s1,d0
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 1.0 mtr.

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- Reduced labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling cost

Use Limitations

ALPHAFLEX ISO is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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1.070 SONODEC® ACOUSTICALLY INSULATED DUCTING

The **SONODEC®** series consists of a perforated aluminum laminate inner duct, a polyester barrier to prevent the diffusion of glass wool particles, thermically and acoustically insulated with a glass wool layer and provided with an Aluminium laminated outer jacket

Applications in practice
- Air-conditioning systems
- Air supply systems
- Preventing condensation in air ventilation systems
- Decreasing of machine noises
- Consult the selection tables

	SONODEC®25	SONODEC®250	SONODEC®CE
Mechanical properties			
Temperature range (°C) inner duct outer duct	-30 - +140 -30 - +140	-30 - +250 -30 - +140	-30 - +250 -30 - +140
Maximum operating pressure (Pa)	+2500	+2500	+2500
Maximum air velocity (m/s)	30	30	30
Diameter range (mm)	76 - 508	65 - 635	102 - 508
Fire classes according to			
The Netherlands (NEN 6065/6066)	1	1	x
Germany (DIN 4102)	B2	B1	x
France (CSTB)	M1	M0/M1	M0/M1
Switzerland (BKZ)	x	5.2	x
United Kingdom (BS 476)	6, 7 and 20	6, 7 and 20	x
Austria (B3800)	B1	B1	x
Italy (CSI)	1-0	1-0	x
Technical data			
Article code	DS{Ø}/Length	DSX{Ø}/Length	DSXCE{Ø}/Length
Material structure / Construction	see product specific properties		
Wire spacing inner duct -upto Ø 102 - Ø 102 and larger	25 mm 36 mm	25 mm 18[1)]mm	- 36 mm
Minimal bending radius	0.54 x Ø + ↕	0.58 x Ø + ↕	0.54 x Ø + ↕
Standard length (meters)	10	10	10
Standard color	aluminium	aluminium	aluminium

x = not been tested - ↕ = thickness of the glass wool - [1)] = two different wires have been used alternately

Product specific properties
The **SONODEC®** is also available, on request, with a 50 mm glass wool layer, the article number is: DS(x)50{Ø}
- Material structure: - perforated aluminum laminate / barrier / glass wool / aluminum laminate
- Construction:
  - inner duct :aluminum, polyester laminate
  - barrier :closed polyester film *(Sonodec CE no barrier)*
  - glass wool blanket :25 (or 50) mm, 16 kg/m^3
  - outer jacket :aluminum, polyester laminate
- R-value glass wool :0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76)

The **SONODEC®** fulfills all the requirements and are classified as specified within:
EN 13180 :"*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of applications
The **SONODEC®** ducts are not suitable for transporting air with a high concentration of acid and base. Neither are the **SONODEC®** ducts suitable for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.070 SONODEC® ACOUSTICALLY INSULATED DUCTING

SONODEC® 25

Sound attenuation

SONODEC® 25		(Test report nr. AB323-1 Peutz bv - The Netherlands)					
D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz					
		125	250	500	1000	2000	4000
082	1	16	26	33	38	28	17
	2	21	37	48	53	46	29
	3	29	45	49	54	57	38
102	1	9	19	32	37	31	21
	2	19	33	52	53	49	36
	3	25	39	50	52	54	40
127	1	12	20	21	25	29	17
	2	17	31	44	45	46	26
	3	23	46	44	47	51	34
160	1	17	22	22	27	19	14
	2	31	39	34	38	31	20
	3	29	43	41	46	39	27
203	1	7	15	17	20	16	13
	2	20	34	32	35	30	22
	3	18	40	38	41	39	30
254	1	16	16	16	16	13	10
	2	26	31	28	33	25	18
	3	32	36	32	37	34	27
315	1	11	12	12	14	11	7
	2	28	25	22	27	22	15
	3	27	32	28	34	28	19
457	1	12	10	8	8	6	8
	2	20	17	15	16	13	12
	3	25	22	21	25	19	16
508	1	8	8	8	9	6	7
	2	20	17	16	17	11	11
	3	24	22	20	25	15	14

SONODEC® 250

Sound attenuation

SONODEC® 250		(Test report nr. AB323-2 Peutz bv - The Netherlands)					
D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz					
		125	250	500	1000	2000	4000
082	1	16	25	34	38	30	20
	2	22	37	48	54	46	30
	3	30	43	41	43	55	43
102	1	11	25	31	36	23	15
	2	17	31	51	50	38	26
	3	20	44	51	52	51	33
127	1	11	19	23	27	25	19
	2	17	31	43	43	35	22
	3	21	40	45	48	47	27
160	1	15	26	22	27	18	13
	2	22	38	35	39	29	20
	3	33	43	39	43	39	27
203	1	6	13	15	18	11	10
	2	15	31	32	38	21	18
	3	16	36	40	42	28	24
254	1	9	11	12	10	7	11
	2	21	24	24	22	13	15
	3	29	33	31	30	19	24
315	1	8	8	8	7	6	8
	2	16	15	14	13	9	13
	3	23	23	21	19	12	17
457	1	8	8	6	6	5	7
	2	18	15	14	12	8	10
	3	24	21	20	18	11	15
508	1	7	8	7	7	6	7
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-

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1.071 SONODEC®2500 ACOUSTICALLY INSULATED DUCTING

The **SONODEC® 2500** consists of a perforated aluminum laminate inner duct, thermically and acoustically insulated with a glass wool layer and provided with an aluminum laminate outer duct.

Applications in practice
- Air-conditioning systems
- Air supply systems
- Preventing condensation in air ventilation systems
- Decreasing of machine noises
- Consult the selection tables

	SONODEC®2500
Mechanical properties	
Temperature range (°C) inner duct outer duct	-30 - +250 -30 - +250
Maximum operating pressure (Pa)	+2500
Maximum air velocity (m/s)	30
Diameter range (mm)	65 - 635
Fire classes according to	
Europe (EN13501-1)	A2,s1
The Netherlands (NEN 6065/6066)	1
Germany (DIN 4102)	B1
France (CSTB)	M0/M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	6, 7 and 20
Austria (B3800)	x
Technical data	
Article code	DSY{Ø}/Length
Material structure / Construction	see product specific properties
Wire spacing inner duct -upto Ø 102 - Ø 102 and larger	25 mm 18[1)]mm
Minimal bending radius	0.58 x Ø + ↕
Standard length (meters)	10
Standard color	aluminium

↕ = thickness of the glass wool
1) = two different wires have been used alternately

Product specific properties
The **SONODEC® 2500** is also available, on request, with a 50 mm glass wool layer, the article number is: DSY50{Ø}
- Material structure: : perforated aluminum laminate / barrier / glass wool / aluminum laminate
- Construction: - inner duct :aluminum, polyester laminate
  - glass wool blanket :25 (or 50) mm, 16 kg/m^3
  - outer jacket :aluminum, polyester laminate
- R-value glass wool :0.69 (25 mm) or 1.4 (50 mm) m^{2}K/W (ASTM C177-76)

The **SONODEC®** fulfills all the requirements and are classified as specified within:
EN 13180 :"*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of applications
The **SONODEC®** ducts are not suitable for transporting air with a high concentration of acid and base.
Neither are the **SONODEC®** ducts suitable for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.071 SONODEC®2500 ACOUSTICALLY INSULATED DUCTING

Sound attenuation

SONODEC® 2500		(Test report nr. AB323-6 Peutz bv - The Netherlands)					
D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz					
		125	250	500	1000	2000	4000
082	**1**	11	10	16	24	38	27
	2	11	13	25	48	57	40
102	**1**	3	8	19	35	30	19
	2	5	11	24	46	49	32
127	**1**	2	5	9	17	24	19
	2	4	8	19	36	40	25
160	**1**	4	6	12	21	10	8
	2	6	9	18	38	47	26
203	**1**	2	6	12	21	10	8
	2	5	10	22	42	22	17
254	**1**	3	6	11	12	8	11
	2	5	10	19	29	15	13
315	**1**	3	6	11	15	9	9
	2	5	8	15	26	14	16
457	**1**	1	3	6	9	6	8
	2	5	6	11	17	11	11
508	**1**	1	4	9	8	6	7
	2	4	7	15	14	10	9

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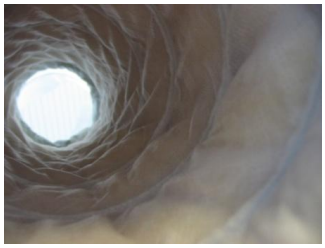
1.072 SONODEC® NONWOVEN

ACOUSTICALLY INSULATED DUCTING

The **SONODEC® NON-Woven** series consists of Cloth innerduct, (BAC with a pp barrier), thermically and acoustically insulated with a glasswool layer and provided with an aluminium laminated outerjacket (BAC - strengthened with glass fibre).

Applications in practice

- Air-conditioning systems
- Air supply systems
- Preventing condensation in air ventilation systems
- Decreasing of machine noises



	SBI	BAC
Mechanical properties		
Temperature range (°C) inner duct outer duct	-30 - +140 -30 - +140	-30 - +140 -30 - +140
Maximum operating pressure (Pa)	+2500	+2500
Maximum air velocity (m/s)	30	30
Diameter range (mm)	52 - 406	52 - 406
Technical data		
Article code	SBI{Ø}/Length	BAC{Ø}/Length
Material structure / Construction	see product specific properties	
Wire spacing inner duct	25 mm	25 mm
Minimal bending radius	0.54 x Ø + ↕	0.54 x Ø + ↕
Standard length (meters)	10	10
Standard color	aluminium	aluminium

- ↕ = thickness of the glass wool

Product specific properties

The **The SONODEC® NON-WOVEN "SBI{Ø}"** is also available, on request, with a 50 mm glass wool layer, the article number is: SBI50{Ø}

- Material structure: - Nonwoven cloth / Yellow Glasswool / Metalized polyester Jacket
- Construction: - Inner duct : Nonwoven cloth
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3
  - Outer jacket : aluminized polyester laminate
- R-value glass wool :0.69 (25 mm) or 1.4 (50 mm) m^2K/W (ASTM C177-76)

The **The SONODEC® NON-WOVEN "BAC{Ø}"** is also available, on request, with a 50 mm glass wool layer, the article number is: BAC50{Ø}

- Material structure: - Nonwoven cloth / Barrier / Pink Glasswool / Metalized polyester Jacket
- Construction: - Inner duct : Nonwoven cloth
  - Barrier : closed polyester film
  - Glass wool blanket : 25 (or 50) mm, 16 kg/m^3
  - Outer jacket : aluminized polyester laminate
- R-value glass wool : R = 0.726 (25 mm), k = 0.039 m^2K/W (ASTM C177-76) R = 1.45(50mm)

The **SONODEC® NON-WOVEN** fulfills all the requirements and are classified as specified within:
EN 13180 : "*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of applications

The **SONODEC® NON-WOVEN** ducts are not suitable for transporting air with a high concentration of acid and base. Neither are the **SONODEC®** ducts suitable for discharging combustion gases.

PLEASE NOTICE:

The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.072 SONODEC® NONWOVEN

ACOUSTICALLY INSULATED DUCTING

Sound attenuation

Non-woven ins. 25mm (Test report nr. A1672-1 Peutz bv - The Netherlands)										
D_n (mm)	**L (m)**	**Attenuation, dB - Mid-frequency, Hz**								**D_i (dB)**
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
080	1.0	13.6	22.4	40.2	38.7	36.5	41.3	51.6	45.8	39
100	1.0	15.9	22.9	31.1	38.6	36.4	40.6	50.1	35.9	39
125	1.0	11.7	18.9	32.4	29.9	28.8	34.5	40.9	24.5	32
150	1.0	12.2	10.9	29.7	30.1	29	38.3	34.6	20.4	32
160	1.0	19.3	25.4	30.5	27.1	23.8	32.2	27.8	17.3	28
200	1.0	10.7	12.1	28.7	22.8	22.8	30.6	19.4	11.9	26
250	1.0	12.9	18.7	24.3	19.5	19.9	27.7	12.9	10.2	22
315	1.0	16.6	23.2	18	15.2	16.5	19.6	10.1	8.5	17
Non-woven ins. 50mm										
100	1.0	4.3	8.5	15.5	28.2	50.8	51	57.8	38.5	30
125	1.0	17.7	26.3	35.4	29.2	33.3	45.4	40.5	26.5	35
160	1.0	16.5	24.1	30.6	27.5	29.6	41.7	28.7	18.1	32
200	1.0	6.5	6.3	21.1	27.1	30.5	35.8	19.4	12.3	29
Non-woven ins. 25mm 3Mtr										
200	3	17.3	30.7	36.8	32.7	34.5	40.3	40.8	22.8	37
250	3	22.4	30.7	33.5	31.0	32.0	38.9	26	16.2	35
315	3	31.7	32.5	29.1	25.2	28.2	37.3	16.6	14.6	30

D_i = Average attenuation

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1.073 SONODEC® CLASSIC Thermal insulated ducting

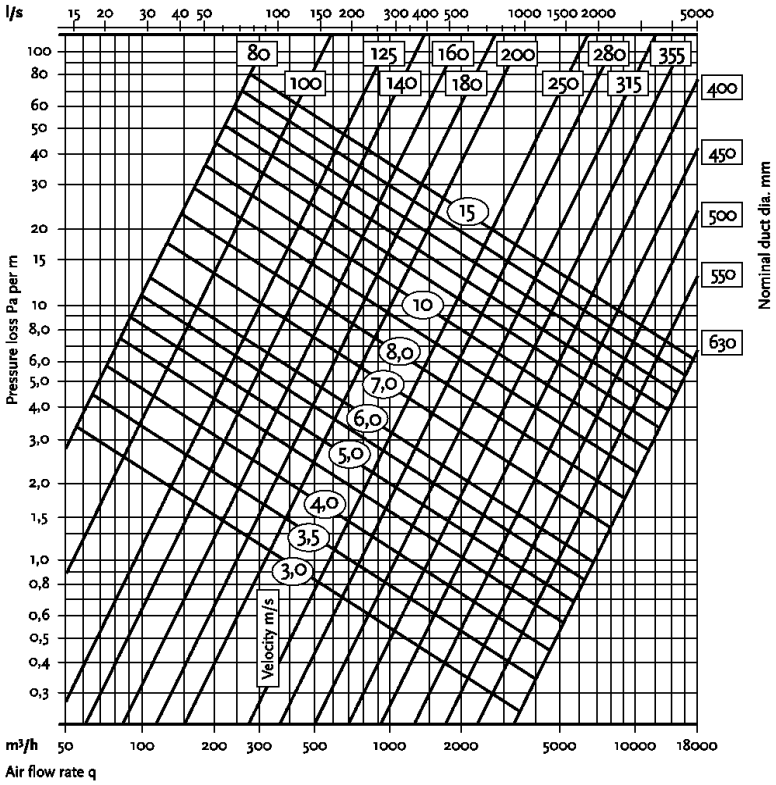
Fully flexible, pre-insulated ducting with a perforated inner core constructed from multiple layers of aluminum and polyester laminated to encapsulate a high carbon, spring steel wire helix. The inner core is covered with an integral barrier and wrapped with a thick blanket of insulation and covered with an outer vapor barrier constructed from multiple layers of aluminized polyester and polyester
Sonodec Classic installs easily on circular or oval fittings.
Sonodec Classic insulated flexible ducting is used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

Specifications
Insulation 25mm thick: R = 0.69 [$m^2 \cdot K/W$]
Minimum Temperature Exposure Limit -30º C
Maximum Temperature Exposure Limit +140º C
Operating Pressure - from -188 to +1500 Pa
Operating Velocity - 20 m/s maximum
Centerline Bend Radius - 1 x Dia. minimum
Standard Diameter Range - 82mm to 560mm
Standard Length - 10 meter

Classifications
French - M1
EU - EN 13180

Packaging
Each 10 meter length flexible duct is individually compressed in cartons of 1.0 mtr.

Pressure loss (Straight duct)



Features & Benefits

Fully Flexible Ducting
- Quick Installation
- Reduced labor cost

Air Tight Construction
- Energy efficient
- Low air leakage

Smooth Interior
- Low friction loss
- Low operating cost

Multi-Layer Construction
- Tear & Puncture Resistant
- Low maintenance

Light Compact Packaging
- Reduced warehouse and handling cost

Use Limitations

Sonodec Classic is not suitable for transporting air with high concentration of acids and base and the duct should not be used to discharge combustion gases from open fire places or oil-fired boilers.

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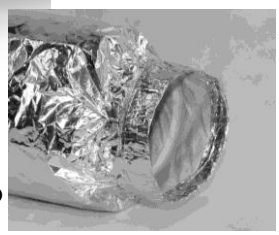
1.081 SONODEC® TRD/GLX Flexible Sound Attenuators

The **Flexible Sound attenuator** series consist of a perforated aluminum ornon-woven inner duct , thermically insulated with a glass wool layer and provided with either an aluminium laminated outer jacket (**SONODEC® TRD**) or an aluminium laminate outer duct (**SONODEC® GLX**). Both lined with a barrier to prevent glass wool particles migration.

SONODEC® GLX

SONODEC® TRD



SONODEC® TRD Non-woven

Application in practice
- Air supply systems
- Air conditioning systems
- Insertion loss damper
- Sound attenuator
- Decreasing sound of machines

The **SONODEC® TRD** has an increased insertion loss, the **SONODEC® GLX,** however, has an increased sound attenuation.

	SONODEC® TRD	**SONODEC® TRD Non-woven**	**SONODEC® GLX**
Mechanical properties			
Temperature range (°C): inner duct outer duct	-30 - +140 -30 - +140	-30 - +140 -30 - +140	-30 - +250 -30 - +140
Maximum operating pressure (Pa)	+2000	+2500	+3000
Maximum air velocity (m/s)	30	30	30
Diameter range (mm)	76 - 635	76 - 406	76 - 635
Fire classes according to			
The Netherlands (NEN 6065/6066)	1	x	1
Germany (DIN 4102)	B2	x	X/B1
France (CSTB)	M1	x	M1/M0
Switzerland (BKZ)	x	x	x/5.2
United Kingdom (BS 476)	6, 7 und 20	x	6, 7 und 20
Austria (B3800)	B1	x	x
Italy (CSI)	1-0	x	x-0
Technical data			
Article code	**DST{Ø}/length**	**SBIT{Ø}/length**	**GX{Ø}/length**
Material structure / Construction	see product specific properties		
Wire spacing inner duct: - until Ø 102 mm - Ø 102 mm and larger	25 mm 36 mm	25 mm 25 mm	25 mm 18 mm
Wire spacing outer jacket	irrelevant	irrelevant	25
Minimum bending radius	0.54 x Ø + ↕	0.54 x Ø + ↕	0.58 x Ø + ↕
Standard length (meters)	0.5, 1.0, 1.5 and 2[1)]	0.5, 1.0, 1.5 and 2[1)]	0.5, 1.0, 1.5 and 2[1)]
Standard color	aluminium	aluminium	aluminium

X = not been tested - ↕ = thickness of the glass wool - [1)] = lengths up to 10 meters on request

The **SONODEC® GLX** and **SONODEC® TRD** fulfills all the requirements and are classified as specified within:
EN 13180 :"*Ventilation for buildings-Ductwork- Dimensions and mechanical requirements for flexible ducts*"

Restrictions in the range of application
The **SONODEC® GLX (Non-woven)** and **SONODEC® TRD** are not suitable for using in rooms with a high concentration of acid and base and for discharging combustion gases.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.081 SONODEC® TRD/GLX Flexible Sound Attenuators

Product specific properties

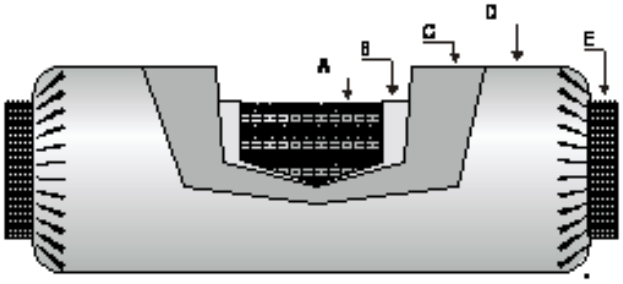
SONODEC® TRD

The **SONODEC® TRD** is also available, on request, with a 50 mm glass wool layer,
the article number is: **DST50{Ø}**/length

- Material structure: - perforated aluminium laminate / barrier / glass wool / aluminium laminate
- Construction: - inner duct : aluminium, polyester laminate.
  - barrier : closed polyester film
  - Insulation blanket: 25 (or 50) mm, 16 kg/m^3
  - outer jacket : aluminium, polyester laminate.
- R-value glass wool: 0.69 (25 mm) or 1.38 (50 mm) m^{2}K/W (ASTM C177-76)

The **The SONODEC® NON-WOVEN TRD** is also available, on request, with a 50 mm glass wool layer,
the article number is: SBIT50{Ø}

- Material structure: - Nonwoven cloth / Glasswool / aluminium laminate (no extra barrier)
- Construction: - Inner duct : Nonwoven cloth
  - Glass wool blanket: 25 (or 50) mm, 16 kg/m^3
  - Outer jacket : aluminium, polyester laminate
- R-value glass wool:0.69 (25 mm) or 1.38 (50 mm) m^{2}K/W (ASTM C177-76)



A. inner duct
B. barrier
C. glass wool
D. outer jacket
E. gasket

Sound attenuation

SONODEC® TRD		(Test report nr. AB323-1 Peutz bv - The Netherlands)					
D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz					
		125	250	500	1000	2000	4000
082	1	16	26	33	38	28	17
	2	21	37	48	53	46	29
102	1	9	19	32	37	31	21
	2	19	33	52	53	49	36
127	1	12	20	21	25	29	17
	2	17	31	44	45	46	26
160	1	17	22	22	27	19	14
	2	31	39	34	38	31	20
203	1	7	15	17	20	16	13
	2	20	34	32	35	30	22
254	1	16	16	16	16	13	10
	2	26	31	28	33	25	18
315	1	11	12	12	14	11	7
	2	28	25	22	27	22	15
457	1	12	10	8	8	6	8
	2	20	17	15	16	13	12
508	1	8	8	8	9	6	7
	2	20	17	16	17	11	11

Sound attenuation

Non-woven ins. 25mm (Test report nr. A1672-1 Peutz bv - The Netherlands)										
D_n (mm)	L (m)	Attenuation, dB - Mid-frequency, Hz								D_i (dB)
		63	125	250	500	1000	2000	4000	8000	
080	1.0	13.6	22.4	40.2	38.7	36.5	41.3	51.6	45.8	39
100	1.0	15.9	22.9	31.1	38.6	36.4	40.6	50.1	35.9	39
125	1.0	11.7	18.9	32.4	29.9	28.8	34.5	40.9	24.5	32
150	1.0	12.2	10.9	29.7	30.1	29	38.3	34.6	20.4	32
160	1.0	19.3	25.4	30.5	27.1	23.8	32.2	27.8	17.3	28
200	1.0	10.7	12.1	28.7	22.8	22.8	30.6	19.4	11.9	26
250	1.0	12.9	18.7	24.3	19.5	19.9	27.7	12.9	10.2	22
315	1.0	16.6	23.2	18	15.2	16.5	19.6	10.1	8.5	17

D_i = Average attenuation

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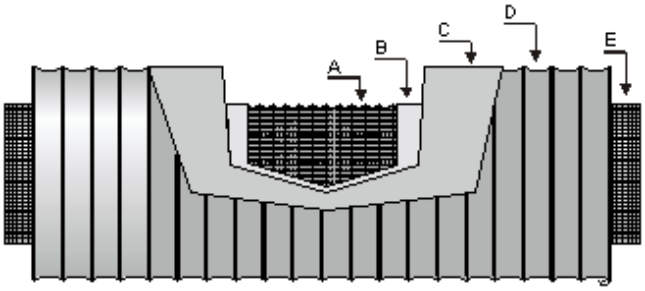
1.081 SONODEC® TRD/GLX Flexible Sound Attenuators

Product specific properties

SONODEC® GLX

The **SONODEC® GLX** is also available, on request, with a 50 mm glass wool layer,
the article number is: **GX50{Ø}**/length

- Material structure: - perforated aluminium laminate / barrier / glass wool / aluminium laminate
- Construction:
  - inner duct : aluminium, polyester laminate.
  - barrier : closed polyester film
  - glass wool blanket : 25 (or 50) mm, 16 kg/m^3
  - outer duct : aluminium, polyester laminate.
- R-value glass wool: 0.69 (25 mm) or 1.38 (50 mm) m^{2}K/W (ASTM C177-76)



A. inner duct
B. barrier
C. glass wool
D. outer jacket
E. gasket

On request the **SONODEC® GLX** can also be ordered with an outer jacket of **COMBIDEC®**,
the articlecode is GXC21B{Ø}/Length

Sound attenuation

SONODEC® GLX		**(Test report nr. AB323-6 Peutz bv - The Netherlands)**					
D_n (mm)	**L (mtr)**	**Attenuation, dB - Mid-frequency, Hz**					
		125	**250**	**500**	**1000**	**2000**	**4000**
082	**1**	11	10	16	24	38	27
	2	11	13	25	48	57	40
102	**1**	3	8	19	35	30	19
	2	5	11	24	46	49	32
127	**1**	2	5	9	17	24	19
	2	4	8	19	36	40	25
160	**1**	4	6	12	21	10	8
	2	6	9	18	38	47	26
203	**1**	2	6	12	21	10	8
	2	5	10	22	42	22	17
254	**1**	3	6	11	12	8	11
	2	5	10	19	29	15	13
315	**1**	3	6	11	15	9	9
	2	5	8	15	26	14	16
457	**1**	1	3	6	9	6	8
	2	5	6	11	17	11	11
508	**1**	1	4	9	8	6	7
	2	4	7	15	14	10	9

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1.082 TSD50 Semi Flexible Sound Attenuators

The semi flexible sound attenuator consists of a corrugated perforated aluminium innerduct and a 2 layer corrugated outerduct with end spigots made of aluminium. The space between the inner and outer duct is filled with 50mm sound absorbing material. **At request a barrier to prevent particle migration can be added.**

Fire Rating: Ducting is tested according DIN4102 and is classified as **A1**

Article code: TSD50{Ø}/Length

Application in practice
- Air supply systems
- Air conditioning systems
- Insertion loss damper
- Sound attenuator
- Decreasing sound of machines

CONSTRUCTION:
Inner Duct : Corrugated, perforated aluminium.
Insulation : Glasswool, thickness 50 mm.
Outer Duct : 2 layer corrugated aluminium.

Technical data	
Colour	aluminium
Material	corrugated aluminium
Temperature range	-30 up to +250 °C
Over pressure	max. 3000 Pa
Under pressure	max. 1500 Pa
Recommended air velocity	max. 10 m/s
Standard length	L = 0.5, 0.75, 1.0, 1.5 and 2.0 m
Bending radius	R = 2 to 3 x D2 (from 1 meter)

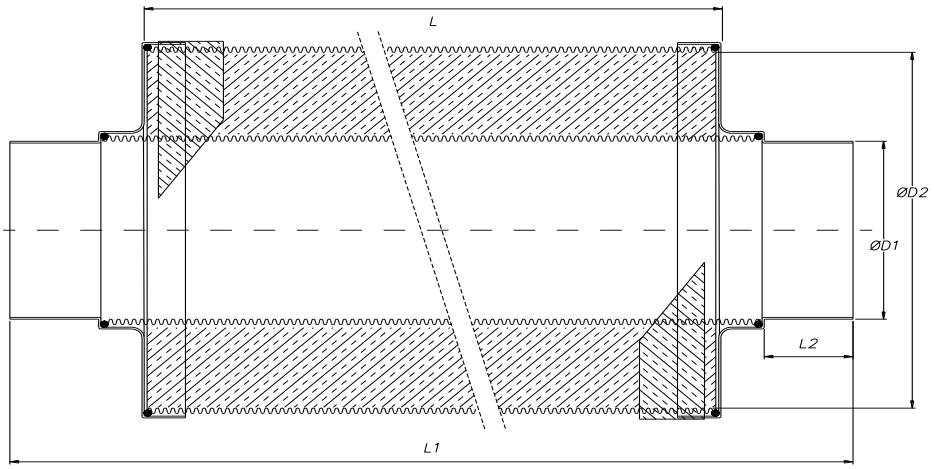
Diameter (Dn) range ØD1 – ØD2 (mm)	
080 – 180	224 – 315
100 - 200	250 – 355
125 - 224	280 – 400
140 - 250	300 – 400
150 – 250	315 - 400
160 – 250	355 - 450
180 – 280	400 - 500
200 – 300	

Sound attenuation, Dimensions and Weights

TSD50 (Test report nr. A1453-1 Peutz bv - The Netherlands)

D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz						D_i (dB)	Weight (kg)
		125	250	500	1000	2000	4000		
080	1	11	16	40	55	65	52	32	1.3
100	1	6	13	23	44	62	41	26	1.5
125	1	7	13	26	44	51	28	27	1.7
150	1	5	11	25	44	40	25	24	1.9
160	1	3	11	25	43	40	20	22	2.0
200	1	4	10	21	43	25	14	21	2.5
250	1	3	9	20	39	15	9	17	3.1
315	1	1	5	14	30	11	6	13	3.6

D_i = Average attenuation



L = Effective length

D< Ø250
L1 = L + 120 mm
L2 = 40 mm

D≥ Ø250
L1 = L + 160 mm
L2 = 60 mm

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1.082 TSD25 Semi Flexible Sound Attenuators

The semi flexible sound attenuator consists of a corrugated perforated aluminium innerduct and a 2 layer corrugated outerduct with end spigots made of aluminium. The space between the inner and outer duct is filled with 50mm sound absorbing material. ***At request a barrier to prevent particle migration can be added.***

Fire Rating: Ducting is tested according DIN4102 and is classified as **A1**

Article code: TSD{Ø}/Length

Application in practice
- Air supply systems
- Air conditioning systems
- Insertion loss damper
- Sound attenuator
- Decreasing sound of machines

CONSTRUCTION:
Inner Duct : Corrugated, perforated aluminium.
Insulation : Glasswool, thickness 25 mm.
Outer Duct : 2 layer corrugated aluminium.

Technical data	
Colour	aluminium
Material	corrugated aluminium
Temperature range	-30 up to +250 °C
Over pressure	max. 3000 Pa
Under pressure	max. 1500 Pa
Recommended air velocity	max. 10 m/s
Standard length	L = 0.5, 0.75, 1.0, 1.5 and 2.0 m
Bending radius	R = 2 to 3 x D2 (from 1 meter)

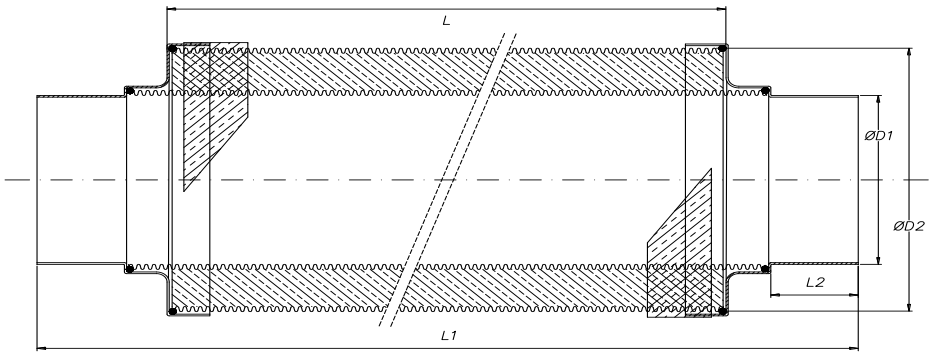
Diameter (Dn) range ØD1 – ØD2 (mm)	
080 – 130	224 – 280
100 – 150	250 – 300
125 – 180	280 – 355
140 – 200	300 – 355
150 – 200	315 – 355
160 – 200	355 – 400
180 – 224	400 – 450
200 – 250	450 – 500

Sound attenuation, Dimensions and Weights

TSD525 (Test report nr. A1453-1 Peutz bv - The Netherlands)

D_n (mm)	L (mtr)	Attenuation, dB - Mid-frequency, Hz						D_i (dB)	Weight (kg)
		125	250	500	1000	2000	4000		
080	1	6	8	19	40	64	40	22	0.8
100	1	3	7	15	37	68	33	20	1.0
125	1	5	8	16	31	51	22	20	1.2
160	1	1	4	9	24	50	18	15	1.5
200	1	2	5	9	22	29	12	15	1.9
250	1	1	3	8	21	18	8	13	2.3

D_i = Average attenuation



L = Effective length

D< Ø250
L1 = L + 120 mm
L2 = 40 mm

D≥ Ø250
L1 = L + 160 mm
L2 = 60 mm

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1.083 GGLX50 Solid Sound Attenuators

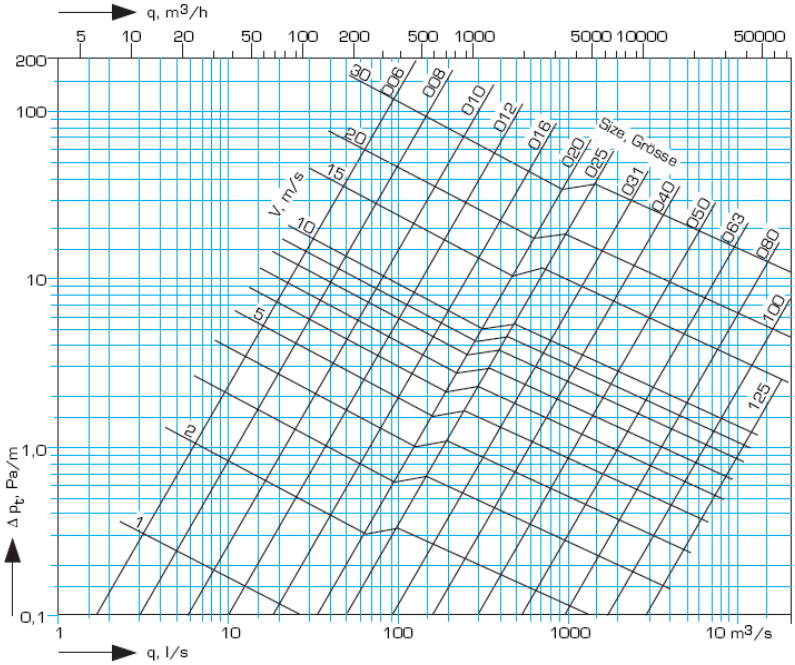
Straight sound absorber insulated with mineral wool.
The Sound absorber consists of a tube of perforated sheet steel enclosed in a casing and end spigots made of sheet steel. The space between the tube and the Casing is filled with sound absorbing material lined with staple fibre fabric to prevent particle migration. Fire resistance class E60, EI30.

Diameter range: Ø100 mm to Ø400 mm.
Lengths available: 0.6 Mtrs and 0.9 Mtrs

Article code: GGLX50{Ø}/Length

Diameter	Length	Attenuation, dB - Mid-frequency, Hz								Diam.Ext.	Weight
mm	Mtr	63	125	250	500	1000	2000	4000	8000	mm	kg
100	0.6	4	8	14	26	34	41	45	25	200	4.1
	0.9	8	11	21	33	48	50	50	28	200	6.6
125	0.6	3	6	12	22	28	37	38	22	255	4.5
	0.9	5	9	18	30	40	48	43	24	225	7.6
160	0.6	2	5	10	18	23	33	30	19	260	5.8
	0.9	3	8	16	27	36	47	37	21	260	9.0
200	0.6	1	4	9	17	22	29	25	18	300	7.0
	0.9	2	7	13	24	31	44	31	20	300	10.0
250	0.6	0	4	8	15	21	24	20	17	355	8.6
	0.9	1	6	11	21	27	39	25	19	355	12.2
315	0.6	0	3	7	14	20	20	17	16	415	9.8
	0.9	0	5	9	18	23	32	20	18	415	15.0
400	-	-	-	-	-	-	-	-	-	-	-
	0.9	1	2	6	13	19	16	8	6	500	21.0

Pressuredrop Diagram GGLX50



PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.084 GGLX-R Square Solid Sound Attenuators

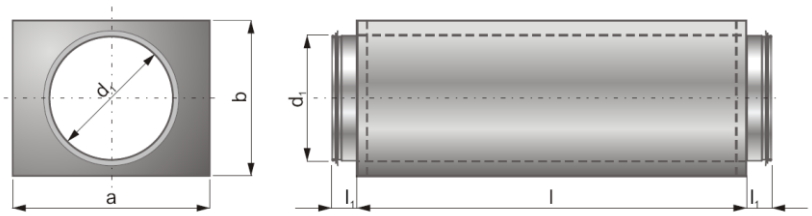
Rectangular silencer with circular connection

TECHNICAL DATA
Usage: Rectangular silencers are designed to absorb the noise in an air conditioning or ventilation ductwork system.The silencers can be used and are suitable for usage in low - and mid pressure airconditioning - or ventilation systems.
The Silencers are suitable for usage in low and mid-pressure ventilation systems.

- The maximum air speed is 20 m/s,
- The maximum working overpressure is up to 2000 Pa and
- The maximum vacuum is 1500Pa.

Silencers GGLX-R are created for an installation in places with lowered height

Standard version:
- With double edged gasket
- Material:
  - the outercover: galvanized sheet
  - Inner cover: perforated sheet
  - isolating layer: mineral wool
- Maximum operating temperature: +100°C
- Standard length L = 500, 1000 mm



Special version:- Nonstandard sizes

PRESSURELOSS/DIMENSIONS

	Dimensions				Pressureloss DPt (Pa)					
Type	a mm	b mm	c mm	d mm	2 m/s	4 m/s	6 m/s	8 m/s	10 m/s	Weight (kg)
GGLX-R100/0,5	210	160	500	35	0	2	4	7	12	4,0
GGLX-R125/0,5	240	180	500	35	1	3	6	11	17	6,0
GGLX-R160/0,5	280	220	500	35	1	4	8	15	23	7,2
GGLX-R200/0,5	330	250	500	35	0	1	3	6	9	5,7
GGLX-R250/0,5	390	310	500	35	1	2	5	8	13	7,1
GGLX-R315/0,5	450	370	500	35	1	3	6	11	18	8,5
GGLX-R400/0,5	550	460	500	55	0	1	2	4	6	7,1
GGLX-R100/1,0	210	160	1000	35	0	1	3	5	7	16,5
GGLX-R125/1,0	240	180	1000	35	0	0	1	2	3	13,2
GGLX-R160/1,0	280	220	1000	35	0	1	1	3	4	16,7
GGLX-R200/1,0	330	250	1000	35	0	1	2	4	6	20,1
GGLX-R250/1,0	390	310	1000	35	0	0	1	1	2	17,3
GGLX-R315/1,0	450	370	1000	35	0	0	1	2	3	21,9
GGLX-R400/1,0	550	460	1000	55	0	1	1	3	4	26,5

sound attenuation

	Attenuation (dB)							
Type	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**
GGLX-R100/0,5	10	14	14	28	53	54	36	22
GGLX-R125/0,5	10	11	13	25	43	43	28	17
GGLX-R160/0,5	7	8	12	22	34	29	16	12
GGLX-R200/0,5	6	7	11	19	26	20	8	8
GGLX-R250/0,5	6	5	10	19	23	16	7	7
GGLX-R315/0,5	4	5	8	16	18	10	5	6
GGLX-R400/0,5	2	4	7	12	12	6	6	6
GGLX-R100/1,0	18	19	27	44	54	54	54	35
GGLX-R125/1,0	18	15	23	41	54	54	49	25
GGLX-R160/1,0	10	11	21	39	54	53	26	18
GGLX-R200/1,0	12	14	16	32	50	39	15	13
GGLX-R250/1,0	12	8	15	33	44	28	13	10
GGLX-R315/1,0	9	9	14	28	36	19	10	10
GGLX-R400/1,0	6	6	13	22	26	12	8	9

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.091 Connectdec type AKUDEC®

Semi Flexible Sound Attenuators

The **AKUDEC®** semi flexible sound attenuator consists of a **heavy multiple layered corrugated perforated aluminium** innerduct and provided with an aluminium layered outer jacket strengthened with glass fibre. The space between the inner and outer duct is filled with 25mm sound absorbing material. The **AKUDEC®** is also available, on request, with a 50 mm glass wool layer. The duct is standard fitted with metal sleeves at both ends to fit to any rigid ductwork or appliance instantly.
Choice between: (Fit according to EN1506)
Type 1) Male - Male
Type 2) Male - Female
Type 3) Female – Female
Article code: AKU(1,2,or3){Ø}/Length e.g. AKU3100/1.0 (type 3 Ø100mm)

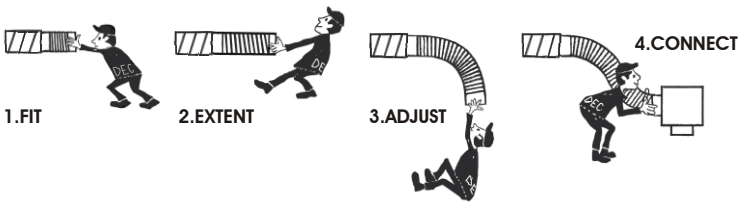
Applications in practice
- **THE Solution to over bridge inaccuracy in measurements.**
- **Saves installation time and material.**
- Can be combined immediately with our air valves (e.g. DAV or DVSC))
- Air supply systems
- Air conditioning systems
- Insertion loss damper
- Sound attenuator
- Decreasing sound of machines

Technical data	
Colour	aluminium
Material	corrugated aluminium
Temperature range	-30 up to +140 °C
Over pressure	max. 2000 Pa
Recommended air velocity	max. 10 m/s
Standard length	L = 0.5 and 1.0 m
Bending radius	R = 2 x D2
Connecting Sleeves	Galvanized steel

CONSTRUCTION
Inner Duct: Multiple layer corrugated, perforated aluminium.
Insulation: Glasswool, thickness 25 mm.
Outer Jacket: Jacket of Laminated aluminium.

Fire Rating:
The inner ducting is according to the German norm **DIN4102** and to the European norm **EN13501-1** and Classified as **A1**. The outerjacket is accoring to the European norm **EN13501-1** and Classified as **Bs1.**

HOW TO INSTALL:



Sound attenuation

AKUDEC 25mm (Test report nr. A1672-1 Peutz bv - The Netherlands)

D_n (mm)	L (m)	Attenuation, dB - Mid-frequency, Hz								D_i (dB)
		63	125	250	500	1000	2000	4000	8000	
080	0.5	11.2	13.3	24.1	29.7	27.2	33.4	32.9	23.5	30
100	0.5	11.9	11.4	22.6	26.8	22.1	29.2	25.8	16.7	26
125	0.5	6.3	7.1	15.2	19.9	20.3	26.1	17.1	12.9	22
150	0.5	8.3	9.3	17.8	19.4	16.7	25	19.8	13.8	21
160	0.5	10.2	11.3	21.5	17.9	15.5	22.6	15.7	12.1	19
200	0.5	9.2	10	17.3	14.3	12.9	15.8	12	8.2	14
250	0.5	10.2	9.8	14.6	11.7	10.8	14.3	8	7.1	12
315	0.5	9.2	11.4	12	9.4	8.3	8	4.7	5.3	8
D_n (mm)	L (m)	Attenuation, dB - Mid-frequency, Hz								D_i (dB)
		63	125	250	500	1000	2000	4000	8000	
080	1.0	13.8	20.2	39.3	38.6	36	41.8	52.4	40.2	39
100	1.0	9.5	14.5	28.6	37.4	35.6	39.8	44.3	29.5	36
125	1.0	12.4	20.1	33.6	29.8	29.5	33.6	32.1	23.6	32
150	1.0	11.1	11.8	34.2	28.5	26.3	34.9	27.2	21.8	30
160	1.0	14.6	19.1	31.1	27	24.7	32.5	24	18.7	29
200	1.0	11.1	14.6	29.5	20.7	21	30	17.7	13.2	23
250	1.0	14.2	21.7	23.1	18.9	18.4	25.7	11.4	10.1	20
315	1.0	10.8	21.9	17.9	15.5	17.7	16.7	9.2	9.3	17

D_i = Average attenuation

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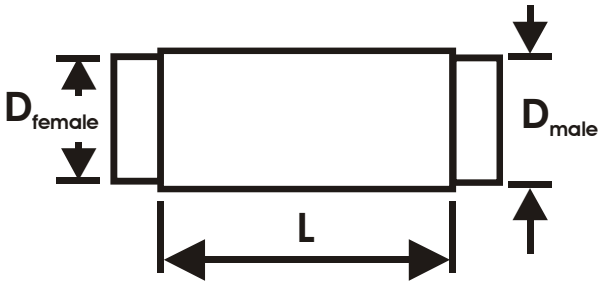
1.091 Connectdec type AKUDEC®

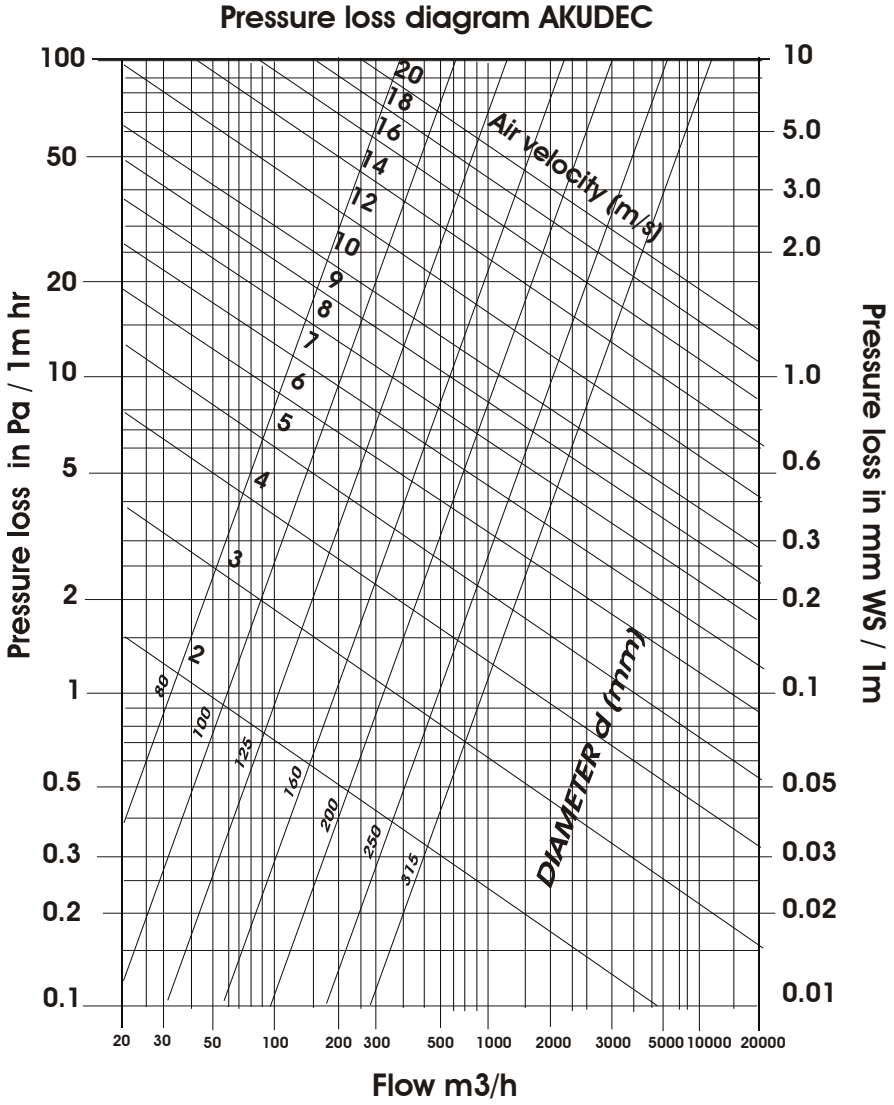
Semi Flexible Sound Attenuators

Restrictions in the range of application
The **CONNECTDEC® type AKUDEC®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties. These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

EN-1506			
D_{nom} (mm)	D_{female} (mm)	D_{male} (mm)	Tol.
080	80.5	79.3	+0 ; -0.5
100	100.5	99.3	+0 ; -0.5
125	125.5	124.3	+0 ; -0.5
150	150.6	149.3	+0 ; -0.6
160	160.6	159.3	+0 ; -0.6
200	200.7	199.3	+0 ; -0.7
250	250.8	149.3	+0 ; -0.8
315	315.9	314.3	+0 ; -0.9





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1.092 Connectdec type NON-WOVEN ins.

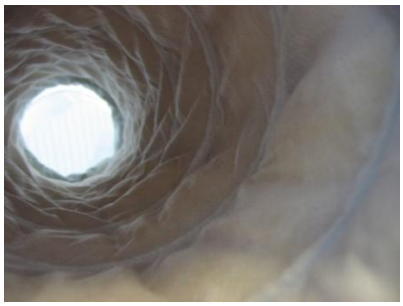
Flexible Sound Attenuators

The **CONNECTDEC™ Type Non-woven insulated** flexible sound attenuator consists of a **non-woven** innerduct and provided with an aluminium layered outer jacket strengthened with glass fibre. The space between the inner and outer duct is filled with 25mm sound absorbing material. The **attennuator** is also available, on request, with a 50 mm glass wool layer. The duct is standard fitted with metal sleeves at both ends to fit to any rigid ductwork or appliance instantly.
Choice between: (Fit according to EN1506)

Type 1) Male – Male
Type 2) Male - Female
Type 3) Female – Female

Article code: CO(1,2,or3)SB{Ø}/Length
e.g. CO3SB100/1,0 (type 3 Ø100mm)

THE Solution to over bridge inaccuracy in measurements.
Saves installation time and material.



Applications in practice

- Sound attenuator
- In combination with heat exchanges, heat pumps
- Air supply systems
- Air conditioning systems
- Insertion loss damper

CONSTRUCTION
Inner Duct: Non-woven cloth.
Insulation: Glasswool, thickness 25 mm.
Outer Jacket: Jacket of Laminated aluminium.

Technical data	
Colour	aluminium
Material	Non-woven cloth
Temperature range	-30 up to +140 °C
Over pressure	max. 2000 Pa
Recommended air velocity	max. 10 m/s
Standard length	L = 0,5 and 1,0 m
Connecting Sleeves	Galvanized steel

Fire Rating:
The outerjacket is accoring **EN13501-1 Bs1.**

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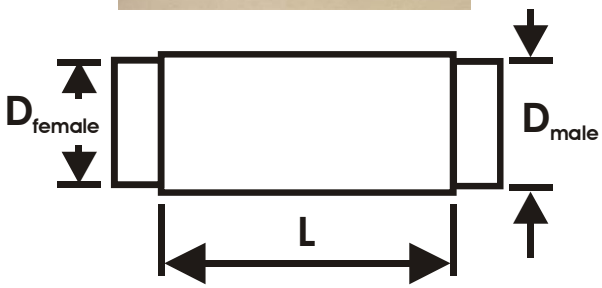
1.092 Connectdec type NON-WOVEN ins.

Flexible Sound Attenuators

EN-1506			
D_{nom} (mm)	D_{female} (mm)	D_{male} (mm)	Tol.
080	80.5	79.3	+0 ; -0.5
100	100.5	99.3	+0 ; -0.5
125	125.5	124.3	+0 ; -0.5
150	150.6	149.3	+0 ; -0.6
160	160.6	159.3	+0 ; -0.6
200	200.7	199.3	+0 ; -0.7
250	250.8	149.3	+0 ; -0.8
315	315.9	314.3	+0 ; -0.9

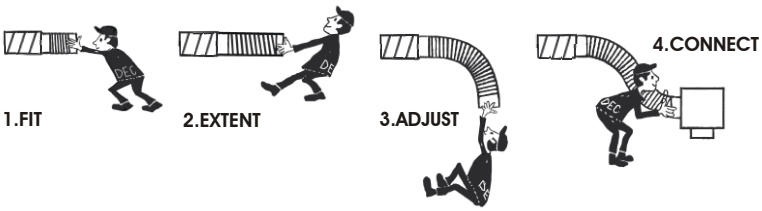


Sound attenuation

Non-woven ins. 25mm (Test report nr. A1672-1 Peutz bv - The Netherlands)										
D_n (mm)	L (m)	Attenuation, dB - Mid-frequency, Hz								D_i (dB)
		63	125	250	500	1000	2000	4000	8000	
080	1.0	13.6	22.4	40.2	38.7	36.5	41.3	51.6	45.8	39
100	1.0	15.9	22.9	31.1	38.6	36.4	40.6	50.1	35.9	39
125	1.0	11.7	18.9	32.4	29.9	28.8	34.5	40.9	24.5	32
150	1.0	12.2	10.9	29.7	30.1	29	38.3	34.6	20.4	32
160	1.0	19.3	25.4	30.5	27.1	23.8	32.2	27.8	17.3	28
200	1.0	10.7	12.1	28.7	22.8	22.8	30.6	19.4	11.9	26
250	1.0	12.9	18.7	24.3	19.5	19.9	27.7	12.9	10.2	22
315	1.0	16.6	23.2	18	15.2	16.5	19.6	10.1	8.5	17
Non-woven ins. 50mm										
100	1.0	4.3	8.5	15.5	28.2	50.8	51	57.8	38.5	30
125	1.0	17.7	26.3	35.4	29.2	33.3	45.4	40.5	26.5	35
160	1.0	16.5	24.1	30.6	27.5	29.6	41.7	28.7	18.1	32
200	1.0	6.5	6.3	21.1	27.1	30.5	35.8	19.4	12.3	29
Non-woven ins. 25mm 3Mtr										
200	3	17.3	30.7	36.8	32.7	34.5	40.3	40.8	22.8	37
250	3	22.4	30.7	33.5	31.0	32.0	38.9	26	16.2	35
315	3	31.7	32.5	29.1	25.2	28.2	37.3	16.6	14.6	30

D_i = Average attenuation

HOW TO INSTALL:



Restrictions in the range of application

The **CONNECTDEC™ type Compacdec®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:

The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
These properties are also dependent on humidity and the temperature of the air inside and outside of the H.V.A.C. system.

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1.093 Connectdec type Compacdec®

Semi Flexible Ducting

CONNECTDEC™ type Compacdec® is a superb flexible duct constructed out of **heavy multiple layered corrugated aluminium**. By the inter lockseam a high airtighness and flexibility is reached. The duct is standard fitted with metal sleeves at both ends to fit to any rigid ductwork or appliance instantly.
Choice between: (Fit according to EN1506)

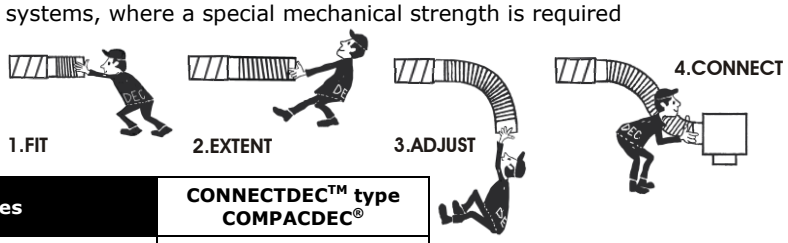
Type 1) Male - Male
Type 2) Male - Female
Type 3) Female – Female
Article code: CO(1, 2 or 3)CD2{Ø}/Length
e.g. CO3CD100/1.0 (type 3 Ø100mm x 1mtr)

- Handy connection between ventilation unit and ducting.
- Fire resistant according to the German norm **DIN4102** and to the European norm **EN13501-1** and Classified as **A1**.
- Mechanical manufactured according **NEN-EN13180**.

Applications in practice

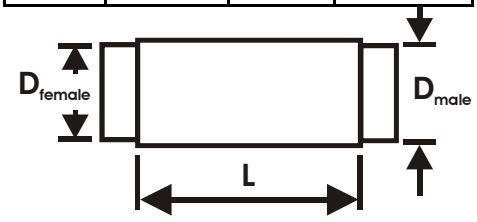
- **THE Solution to over bridge inaccuracy in measurements**
- **Saves installation time and material**
- To be combined immediately with our air valves (e.g. DAV or DVSC)
- Mechanical air supply systems
- Air conditioning systems
- Systems, where vapors should be exhausted
- Above mentioned systems, where a special mechanical strength is required

HOW TO INSTALL



Mechanical properties	CONNECTDEC™ type COMPACDEC®
Temperature range (°C)	-30 - +250
Peak. value (°C)	+400
Max. operating pressure (Pa)	+3000
Max. air velocity (m/s)	30
Diameter range (mm)	080 - 315
Fire classes according to	**COMPACDEC®**
Europe (EN13501-1)	A1
The Netherlands (NEN6065/6066)	1
Germany (DIN 4102)	A1
France (CSTB)	M0
Switzerland (BKZ)	6Q3
United Kingdom (BS 476)	4, 6, 7 and 20
Austria (B3800)	A1
Sweden (Swedcert)	A15
Italy (CSI)	0
Technical Data	**COMPACDEC®**
Material Construction	2 Layers aluminium
Minimum bending radius	1 x Ø
Standard length (meters)	0.5 – 1.0 – 1.5
Standard Color	Aluminium
Connecting Sleeves	Galvanized steel

EN-1506			
D_{nom} (mm)	D_{female} (mm)	D_{male} (mm)	Tol.
080	80.5	79.3	+0 ; -0.5
100	100.5	99.3	+0 ; -0.5
125	125.5	124.3	+0 ; -0.5
150	150.6	149.3	+0 ; -0.6
160	160.6	159.3	+0 ; -0.6
200	200.7	199.3	+0 ; -0.7
250	250.8	149.3	+0 ; -0.8
315	315.9	314.3	+0 ; -0.9



Restrictions in the range of application
The **CONNECTDEC™ type Compacdec®** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
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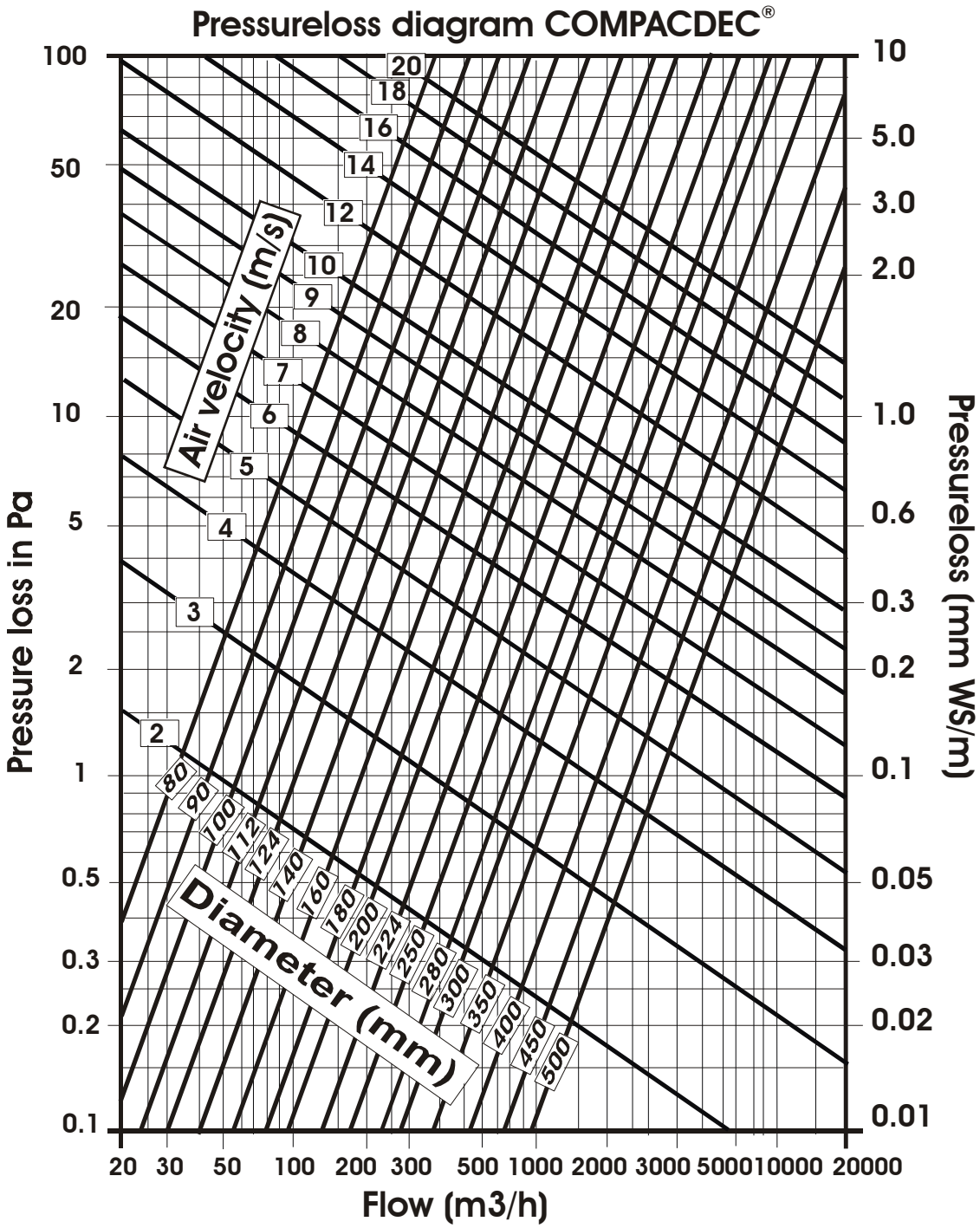
1.093 Connectdec type Compacdec®

Semi Flexible Ducting



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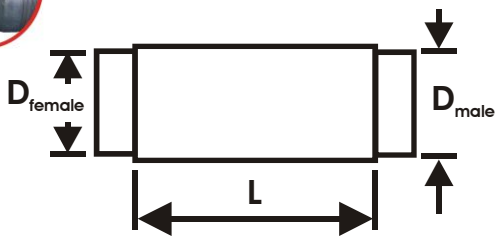
1.094 Connectdec type Combidec GLX

Flexible Sound Attenuators

The **CONNECTDEC™ Type Combidec insulated** flexible sound attenuator consists of an Aluminium laminated innerduct and provided with a Combidec outer jacket. The space between the inner and outer duct is filled with 25mm sound absorbing material. The **attennuator** is also available, on request, with a 50 mm glass wool layer. The duct is standard fitted with metal sleeves at both ends to fit to any rigid ductwork or appliance instantly. Choice between: (Fit according to EN1506)

Type 1) Male – Male
Type 2) Male - Female
Type 3) Female – Female
Article code: CO(1,2,or3)GX21G{Ø}/Length e.g. CO2GX21G100/1,0 (type 3 Ø100m

THE Solution to over bridge inaccuracy in measurements.
Saves installation time and material.



Applications in practice

- Sound attenuator
- In combination with heat exchanges, heat pumps
- Air supply systems
- Air conditioning systems
- Insertion loss damper

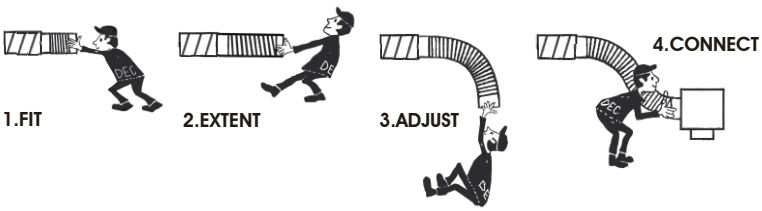
CONSTRUCTION

Inner Duct: Alu/poly laminate.
Insulation: Glasswool, thickness 25 mm.
Outer Jacket: Alu/Poly laminated covered with a PVC layer.

Technical data	
Colour	Grey (also available in Black)
Material	Alu/Poly/PVC
Temperature range	-30 up to +140 °C
Over pressure	max. 2000 Pa
Recommended air velocity	max. 10 m/s
Standard length	L = 0,5 and 1,0 m
Connecting Sleeves	Galvanized steel

EN-1506			
D_{nom} (mm)	D_{female} (mm)	D_{male} (mm)	Tol.
080	80.5	79.3	+0 ; -0.5
100	100.5	99.3	+0 ; -0.5
125	125.5	124.3	+0 ; -0.5
150	150.6	149.3	+0 ; -0.6
160	160.6	159.3	+0 ; -0.6
200	200.7	199.3	+0 ; -0.7
250	250.8	149.3	+0 ; -0.8
315	315.9	314.3	+0 ; -0.9

HOW TO INSTALL:



Restrictions in the range of application
The **CONNECTDEC™ type Combidec GLX** is not suitable for transporting air with a high concentration of acid and base.

PLEASE NOTICE:
The consultant is responsible for the actual installation and mounting of the product.
The mentioned values with respect to temperatures are not appropriate to be used to determine the physical properties.
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2.000 General Information Fixing and Sealing

SEALING AND FASTENING SYSTEMS.
DEC International® delivers various tapes to support the product assortment of flexible ducts. The tapes have been composed from different raw materials to ensure that the tape you need can be delivered by **DEC International®**. The tapes should be applied to dust-free and fat-free surfaces to get a good adhesion.

DEC also offers a wide choice of products for sealing various components of air conditioning- and air supply systems.

The operating pressure has been measured under laboratory circumstances at a 20°C temperature. The information below is only informative. **DEC International®** disclaimes all responsibility of misinterpreting the data.

To select the appropriate product within the **SEALING AND FASTENING** group consult the table below.

TAPES

Type	Temp. range (°C)	Max. Operating pressure (Pa) at + 20°C	Adhesion[1)]	Max. adhesion after/per	Application[2)]	Fire resistance according to
ASB	-20 - +70	+2000	2.0 kg/cm	24 hours	▲▼	DIN 4102, B2
PSB	-20 - +60	+4000	3.6 kg/cm	24 hours	▲	DIN 4102, B2
ALU	-10 - +90	+1000	38 N/2.5 cm	immediately	▲▼	BS476 Part 7, klasse 1
ALU-R	-10 - +90	+1000	38 N/2.5 cm	immediately	▲▼	BS476 Part 7, klasse 1
PVC	-18 - +90	+1000	0.4 kg/2.5 cm	immediately	▲	-
Duct tape	-20 - +75	+1500	0.55 kg/ cm	immediately	▲▼	-

SEALING MATERIALS

Type	Temp. range (°C)	Max. Operating pressure (Pa)	Adhesion[1)]	Drying time	Application[2)]	Fire resistance according to
GT	-30- +80	irrelevant	1.0 kg/2.5 cm	inmediately	▲▼	DIN 4102, B3
FS2000 / DEC050	-30- +100	+3000	-	72 hours	▲▼	DIN 4102, B1
SDS	-25- +75	+2500	-	immediately	▲	CSTB,class M1
WDS	-30- +80	+2500	-	48 hours	▲	-

1) the surface has been specified on the information page:
2) application - ▲ = inside use - ▼ = outside use

DEC International® offers you a large number of fastening articles for a wide range of purposes. All products within the **FASTENING** product group are intended for mounting ducts and flexible ducts. This product group also contains a number of products on behalf of the fastening of flexible ducts to round, rectangular and oval connections.
The support clamps are particularly suitable for suspending heavier weights, e.g. air conditioning units.

FASTENING PRODUCTS

Type	diameter /size	material
Flexible connection "DEC Connector" Sendzimir galv. steel or stainless steel with: • Silicone • Polyurethane • Neoprene • Vinyl	variable	Sendzimir galv. steel or stainless steel (316 Ti) with: • silicone • polyurethane • neoprene • vinyl
Metal clamp	variable, 50 - 660 mm	• strip: stainless steel • clamp:galvanized steel
Multiband/clamps	variable, until 30 metres	• strip: stainless steel • clamp: galvanized steel
Nylon Quick Clamps	variable, 0 - mm	Nylon
Spiral clamps	fixed, 80 - 400 mm	Sendzimir galv. steel
Self drilling screws	13 - 50 mm	Galvanized steel
Self-adhesive pins	19 - 140 mm	Galvanized steel
Welding pins	25 - 105 mm	Galvanized steel
Support clamps	M6 up to and incl. M12	Galvanized steel
Threaded rods	M6 up to and incl. M12	Galvanized steel
Suspension strap • Type PP • Type PZ	width 19 mm width 17 mm	• copolymer coated galv. Steel • galvanized steel

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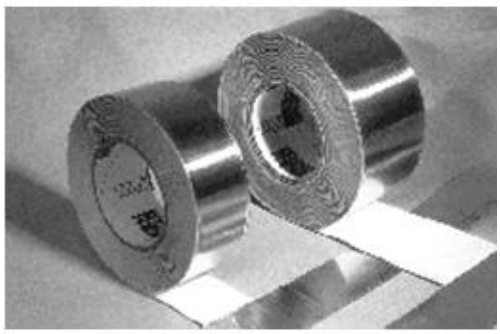
2.010 ASB - COLD SHRINK TAPE

Fixing and Sealing

ASB a heavy duty self vulcanising duct sealing tape; it has an aluminium backing and a strong self bonding layer (adhesive); it provides a sure and lasting moistureproof and sealingproof barrier against weather influences; it is impervious to wind, rain and snow when properly applied.

CONSTRUCTION
a compound of an elastomeric, modified butyl rubber adhesive.
It is laminated with an 0.04mm thick aluminum foil and covered by a silicone treated foil liner. Available in 1.0(standard) and 0.8mm



APPLICATION
Indoor and outdoor airductsealing; it's all weather resistance is excellent, it can also be used for roof flashing and repair jobs; upon hand application, it instantly provides a sure, watertight and airtight bond which grows stronger with time; no special skill is required; drying or heating is not needed; the tape should be pressed down firmly; the work period can be substantially reduced; can be over painted and adheres to metal, concrete, stone, plastic, wood ect.

DELIVERY PROGRAM
ASB-tape is available in three different standard widths: 050, 075 and 100mm.
The standard length is 15m per roll. Ordering code: **ASB7{width}**

OPERATING TEMPERATURE
ASB-tape is suitable for applications within the following temperature range: -20 up to +70 °C.

OPERATING PRESSURE
ASB-tape is suitable for processing up to an over pressure of +2000 Pa.

ADHESION
The product adheres completely within 24 hours. The adhesion to galvanized steel is 2.0 kg/cm if the surface is dry, fat-free and dust-free. The adhesion will be most effective if the tape is pressed firmly.

FIRE RESISTANCE
After testing the tape has been classified into class B2, according to DIN 4102.

STORAGE
ASB has a lifespan of two years if the packaging is dry and sealed. (between 5°-35°C)

USERS GUIDE
Surfaces must be clean and free of moisture and foreign contamination;
a remote trace of moisture will seriously affect adhesion
The application temperature must be higher than 5°C. Particularly when the tape is going to be attached at a lower temperature it should be pressed firmly.
Applicate on round and square ducts. If the duct has a diameter >250mm, some clearance between the ducts can be expected due to the tolerance; we advice to use only **ASB** width 75mm or wider. Use an overlap of 5cm or larger.

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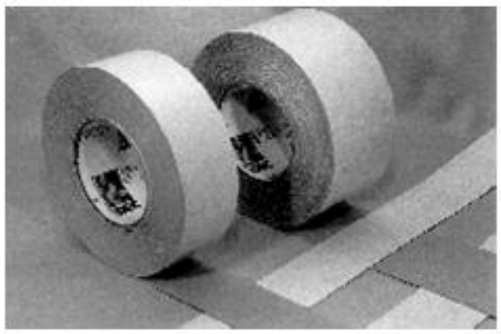
2.020 PSB - COLD SHRINK TAPE

Fixing and Sealing

PSB: a heavy duty self vulcanising duct sealing tape; it is developed to meet industry's increasing demand for airtight ducts. The method of application will save up 80% on labour costs over other methods and provides an excellent airtight seal. ***Only for indoor use !***

CONSTRUCTION
a compound of an elastomeric, pressure sensitive adhesive. It is laminated with an extendable 0.03mm thick polyethylene foil and further covered by a paper release liner.
Thickness: 0.95mm (±3%) (also available 0.8MM)
Backing: PE dark grey color



APPLICATION
The airduct sealing; special recommended for round or oval ducts; the tape has an immediate high "tack" and bonds within 24 hours; once applied the tape provides a superb adhesion on galvanized or aluminum; for maximum adhesion the surface must be clean and free of moisture and foreigh contamination (commercialle clean); a remote trace of moisture will seriously affect adhesion; do not stretch over 8%; the tape should be pressed down firmly.
Please read our application instructions as enclosed in the packing carefully.

DELIVERY PROGRAM
Available in three different standard widths: 050, 075 and 100mm.
The standard length is 15m per roll. Ordering code: **PSB3{width}**.

OPERATING TEMPERATURE
PSB-tape is suitable for application within the following temperature range: -20 up to 60°C.

OPERATING PRESSURE
Suitable for processing up to an over pressure of: +4000Pa (HSTM-0010),
measured individually at a temperature of +20°C.

ADHESION
The product adheres completely within 24 hours.
The adhesion to galvanized steel is 3.6 kg/cm, if the surface is fat-free, dust-free and very dry.
The adhesion will be most effective if the tape is pressed firmly.

FIRE RESISTANCE
After testing the tape has been classified into class B2, according to DIN 4102.

STORAGE
PSB has a lifespan of two years if the packaging is dry and sealed.

USERS GUIDE
Surfaces must be clean and free of moisture and foreign contamination;
a remote trace of moisture will seriously affect adhesion
The application temperature must be higher than 5°C. Particularly when the tape is going to be attached at a lower temperature it should be pressed firmly.

Applicate mainly on round ducts. A max stretch of 3% is allowed and will help the tape to set itself on the duct. If the duct has a diameter >250mm, some clearance between the ducts can be expected due to the tolerance; we advice to use only **ASB** width 75mm or wider. Use an overlap of 5cm or larger.

Do not use PSB for outdoor applications !

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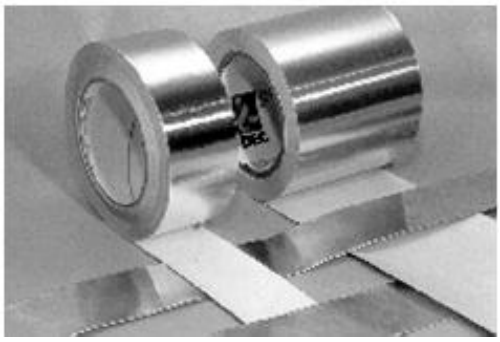
2.030 ALU TAPE Fixing and Sealing

ALU-TAPE is a strong aluminium foil-tape suitable for sealing in air conditioning systems and for insulation operations.

CONSTRUCTION
The tape has been built up out of an aluminium foil layer, inside provided with a rubber sealing coat. The elongation is 5-7%, depending on the thickness.



DELIVERY PROGRAM
ALU-TAPE is standard available in two different widths: 50 and 75mm (100mm on request). The standard length is 45m per roll. The standard thickness is 30 microns. Ordering code **ALU{width}**.

A thickness of 40 microns is available as well.
The 75mm **ALU-TAPE** with a thickness of 40 microns can be ordered in the following way: **ALU075/40**.

OPERATING TEMPERATURE.
ALU-TAPE is suitable for application within the following temperature range: -10 up to +90°C.
The processing has to take place between -5 °C and +40°C.

OPERATING PRESSURE
ALU-TAPE is suitable for processing until an over pressure of: +1000Pa.

ADHESION
The adhesion is 38N/2.5cm after 24 hours if the surface is fat-free and dust-free.
The ultimate tensile strength is 65-70N/2.5cm.

FIRE RESISTANCE
The **ALU-TAPE** with a thickness of 30 microns has been classified into class B PA111 2.2266, according to DIN 4102 (Germany). It has also been classified into class 1, according to BS 476, part 6 & 7 (United Kingdom).

The **ALU-TAPE** with a thickness of 40 microns has been classified into class M1, according to the CSTB (France).
It has also been classified into class 1 according to BS 476, part 6 & 7 (United Kingdom).

STORAGE
ALU-TAPE has a lifespan of one year within the temperature range +10°C and +30°C if the packaging is dry and sealed.

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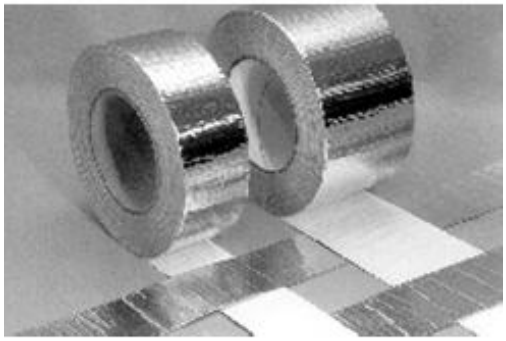
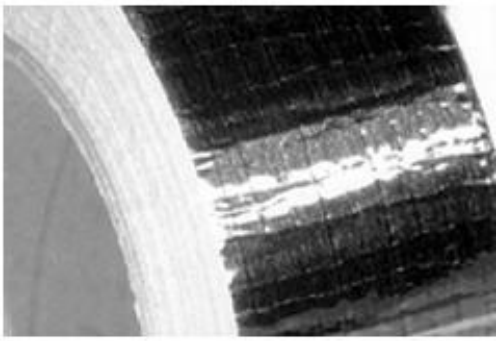
2.040 ALU-REINFORCED TAPE Fixing and Sealing

ALU-R is a glass-fibre reinforced aluminium-tape appropriate to sealing in air conditioning systems and insulation operations.

CONSTRUCTION

The tape has been built up out of a layer of aluminium foil which has been provided with a rubber sealing coat. The aluminium outside layer has been strengthened with 5mm^2 glass scrim.
The total thickness is 30 microns.
The elongation is 3-5%.





DELIVERY PROGRAM

ALU-R is available in 2 different widths: 050 and 075mm.
The standard length per roll is 45m.

Ordering code: **ALU{width}R**

OPERATING TEMPERATURE

ALU-R is suitable for application within the following temperature range: -10 up to 90°C.
The processing has to take place between -5 and +40°C.

OPERATING PRESSURE

ALU-R is suitable for processing until an over pressure of: +1000Pa.

ADHESION

The adhesion is 38N/2.5cm after 24 hours if the surface is fat-free and dust-free.
The ultimate tensile strength is 60-65N/2.5cm (aluminium only).

FIRE RESISTANCE

Classified in class 1 according to BS476, part 7 (United Kingdom)

STORAGE

ALU-R has a lifespan of one year within the temperature range +10°C and +30°C if the packaging is dry and sealed.

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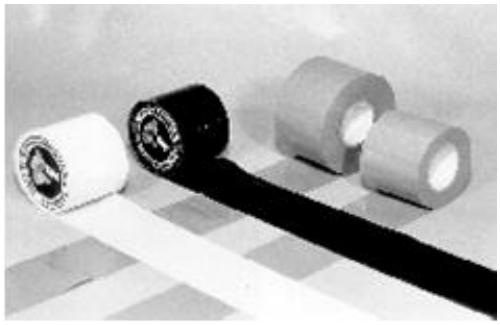
2.050 PVC TAPE Fixing and Sealing

PVC TAPE is appropriate to many mechanical ventilation systems because of its combination of great adhesive power and great elasticity.

CONSTRUCTION
The tape has been built up out of a layer of pure plasticized PVC, the inside is provided with a sealing coat of synthetic rubber based adhesive.

Free from lead compounds.



DELIVERY PROGRAM
PVC TAPE is standard available in width 50 mm. The standard length per roll is 10, 20 and 33 m. Total tape thickness is 190µm. The standard colour is grey. Other colours are available on request.

OPERATING TEMPERATURE
PVC TAPE is suitable for processing and application within the following temperature range: -18 up to +90°C. **PVC TAPE** is applicable at a temperature between -18°C and +40°C. We advise you to keep the tape at room temperature before applying at temperatures below 0°C.

OPERATING PRESSURE
PVC TAPE is suitable for processing until an over pressure of: +1000 Pa.

ADHESION
The adhesion is 0,4kg/2.5cm if the surface is fat-free and dust-free.
The ultimate tensile strength with an elongation of 240% is 10.5kg/2.5cm.

Tensile strength at break:	193 N / 10 mm²
Adhesion to 2B steel:	1.85 N / 10 mm
Adhesion to backing:	1.75 N / 10 mm

STORAGE
PVC TAPE has a lifespan of one year at room temperature, if the packaging is sealed.

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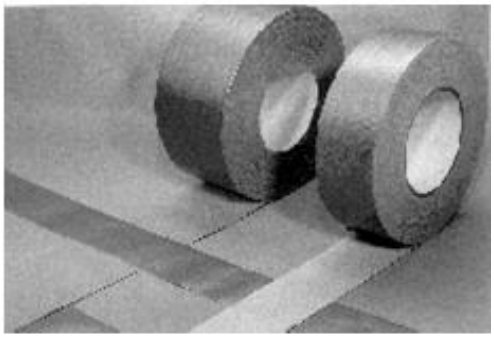
2.060 DUCT TAPE Fixing and Sealing

DUCT TAPE is appropriate to sealing round ducts. It is particularly suitable for applications in mechanical ventilation systems.

CONSTRUCTION
DUCT-TAPE is a linnen-tape, a composition of polyethylene and plastic, provided with a natural rubber sealing coat layer. The maximal elongation is 8%. The total thickness is 310 microns.

DELIVERY PROGRAM
DUCT-TAPE is available in two different standard sizes: 50 and 75mm.
The standard length, per roll, is 50m.
Ordering code: **DUCT[width]**.



OPERATING TEMPERATURE
DUCT-TAPE is suitable for applications within the following range of temperature: -20 up to +75°C.
The processing has to take place between +5 and +30°C

OPERATING PRESSURE
DUCT-TAPE is suitable for processing until an over pressure of: +1500Pa.

ADHESION
The adhesion is 0.55kg/cm if the surface is fat-free and dust-free. The ultimate tensile failure is 5.9kg/cm.

STORAGE
DUCT TAPE has a lifespan of one year at room temperature, if the packaging is sealed.

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2.070 GT TAPE Fixing and Sealing

GT TAPE is particularly appropriate to circumstances where a long life in combination with a high air humidity resistance and chemical inertness is required. The tape is hardly subject to decay. The tape has also a thermic insulating character.

GT TAPE is often used as a sealing material in ventilation systems and machine building.

CONSTRUCTION
(Gasket) **GT TAPE** has been manufactured out of polyethylene foam. The elongation is about 40% (DIN 53577).

DELIVERY PROGRAM
GT TAPE is standard available in 4 different thicknesses: 3, 4, 5, and 6mm.
The width varies between 9 and 50mm. The standard length, per roll is 10m or 20m. The width has been linked up to the thickness as below:
Ordering code: **GT{thickness}/[width]NB Length**

Thickness (mm)	Width (mm)	Length (mtr)
3	15, 50	20
4	9, 12, 15, 25 and 50	20
5	9, 15 and 20	10
6	12, 14 and 19	10

OPERATING TEMPERATURE
GT TAPE is suitable for applications within the following temperature range:-30 up to +80°C.
The processing has to take place between +5 and +40°C.

FIRE RESISTANCE
GT TAPE has been classified into class B3, according to DIN 4102 (Germany).

ADHESION
The adhesion is 1,0kg/2.5cm if the surface is fat-free and dust-free.

STORAGE
GT TAPE has a lifespan of one year at room temperature, if the packaging is sealed.

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2.080 SDS SEALANT Fixing and Sealing

SDS SEALANT is suitable for using where a large pressure resistance and a short drying time is required. It has an excellent adhesion to aluminium and galvanized steel. Because of the thixotrope[1)] properties the sealant can be used for horizontally and vertically applications. **SDS SEALANT** is often used as a sealing compound for air conditioning systems.

SDS SEALANT is for indoor use only!!

CONSTRUCTION
SDS SEALANT is a combination of several kinds of rubber. Several resins have been added as an additive. To achieve a good adhesion to slightly oily surfaces a degreasant has been added as well.
SDS SEALANT contains no PVC or silicon.

DELIVERY PROGRAM
SDS SEALANT is available in two different packaging, a tube or a can. The tube contains 310ml and the can 5kg. The standard packaging contains 25 tubes or 4 cans.
Ordering code tube(s): **SDS400**
Ordering code can(s): **SDS400/5**

OPERATING TEMPERATURE
SDS SEALANT is suitable for applications within the following temperature range:
-25 up to +70°C.
The processing has to take place between +5 and 40°C

OPERATING PRESSURE
SDS SEALANT is suitable for processing up to an overpressure of: +2500Pa,
if applied to a dry and dust-free surface. The surface does not have to be completely oil-free, however the best adhesion results will be on clean surfaces.

FIRE RESISTANCE
SDS SEALANT is, unprocessed, lightly inflammable because of the presence of solvents.
In a hardened version the sealant has been classified in class M1 (France).

STORAGE
SDS SEALANT has a lifespan of 18 months at room temperature (+5°C/+30°C), if the packaging is sealed.

SAFETY
Proper ventilation is needed during processing. Avoid contact with eyes, skin and clothes.

1) The sealant is going to get thinner under the influence of short-time/long prolonging vibrations or mechanical loads. If the vibrations or the loads leaves off, the sealant is going to get thicker again. This phenomenon is called rheological: transformation without cracking.

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2.090 WDS SEALANT Fixing and Sealing

WDS SEALANT is suitable for sealing cracks and seams in ducts and other metal constructions.
WDS SEALANT is for indoor use only.

Some applications are:
- Sealing of air duct in air conditioning systems and mechanical air supply systems
- Finishing for (head ends) and seams of inner- and outer insulation in air ductsystems.

CONSTRUCTION
WDS SEALANT is a combination of various synthetic polymers on a water base. Titanium has been added as an additive. **WDS SEALANT** contains no PVC or silicon.

DELIVERY PROGRAM
WDS is available in two different packaging, a tube or a can. The tube contains 310ml and the can 5 kg.
The standard packaging contains 25 tubes or 4 cans.
Ordering code tube(s): **WDS606**
Ordering code can(s): **WDS606/5**

OPERATING TEMPERATURE
WDS is suitable for application within the following temperature range: -30 up to +80°C. The processing should take place between +5 and +30°C

OPERATING PRESSURE
WDS is suitable for processing until an over pressure of : +2500 Pa

DRYING TIME
After 24 - 48 hrs the **WDS sealant** will be completely hard. Time depending on the used thickness and air humidity. The drying time will be 1 - 12 hrs if the thickness of the sealing is 1 mm.

TOXICITY
Proper ventilation is needed during processing. Avoid contact with eyes, skin and clothes.
The **WDS sealant** is non-toxic.

FIRE RESISTANCE
WDS will hardly be inflammable because of the solvents.
UL tested Nr.723 (Flamespread 5 – Smokedev. 0)

STORAGE
WDS has a lifespan of one year if the packaging is sealed and the temperature is between +5°C and+30°C.

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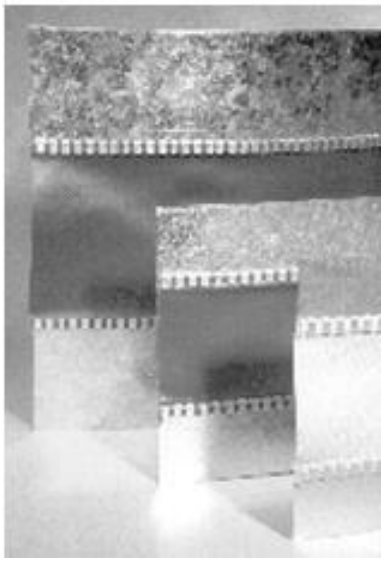
2.100 DEC CONNECTOR Fixing and Sealing

DEC International®'s flexible connection **(DEC CONNECTOR)** has been manufactured out of an already existing steel-to-fabric-to-steel connection, which enables a fast and simple connection between two (rigid) ducts.
Once the galvanized steel overlap has been bent into the correct shape it can be fastened with **DEC International®** *selfdrilling screws* or pop rivets. Another possibility is spotwelding. The result is a solid flexible connection. which can be mounted simply and quickly. It meets the constructional demands.

The standard fabric in the **DEC CONNECTOR** is **VINYL, NEOPRENE**, **POLYURETHANE** and **SILICONE** are available on request. Each type of fabric has its own quality and specific application.
(See product specific information).



All **DEC CONNECTOR** 's meet the British specifications for sheet metal ductwork DW/142 and DW/144

A great advantage of the **DEC CONNECTOR** is e.g. the large range of widths of material. Standard sizes are:

Steel	Fabric	Steel
35 mm	60 mm	35 mm
45 mm	60 mm	45 mm
45 mm	75 mm	45 mm
70 mm	100 mm	70 mm

Beside the standard widths it is possible to produce, on request, the **DEC CONNECTOR** in various other widths.

For further information contact our sales department, because **there are restrictions**.

STANDARD PRODUCTION LENGTH.
The standard production length of the **DEC CONNECTOR** is 25 m (82 feet). Other lengths on request.
If you are interested please contact our sales team.

Applications in practice.

DEC CONNECTOR type VINYL ***Fabric: copolymer coated polyester (PES)***
The fabric with a copolymer coating, used in this type of **DEC CONNECTOR**, is suitable for applications with high requirements to the moisture resistance and less or no mechanical requirements. This connector is appropriate for round, oval and rectangular air ducts. It can be shaped easily with a minimal percentage of waste.

DEC CONNECTOR type SILICONE ***Fabric: silicone coated glass fibre***
The fabric with a silicone coating, used in this type of **DEC CONNECTOR**, is suitable for applications with high mechanical demands to the material. This connector is appropriate for round, oval and rectangular air ducts. It can be shaped easily with a minimal percentage of waste.

DEC CONNECTOR type POLYURETHANE ***Fabric: polyurethane coating glass fibre***
The fabric with a polyurethane coating, used in this type of **DEC CONNECTOR**, is suitable for applications were a high chemical resistance is required. This connector is appropriate for round, oval and rectangular air ducts. It can be shaped easily with a minimal percentage of waste.

DEC CONNECTOR type NEOPRENE ***Fabric: neoprene coated glass fibre***
The fabric with a neoprene coating, used in this type of **DEC CONNECTOR**, is suitable for applications were a high chemical resistance is required. This connector is appropriate for round, oval and rectangular air ducts. It can be shaped easily with a minimal percentage of waste.

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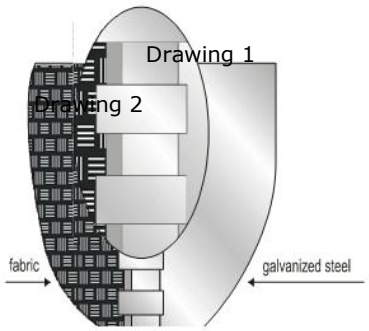
2.100 DEC CONNECTOR Fixing and Sealing

FLANGED SEAM
In the **DEC CONNECTOR**, particularly developed, various unique properties have been used, a.o. the modern flanged seam technology. Mostly a simple flanged seam has been used in similar products. The **DEC CONNECTOR** has been produced with a flanged seam with 4 layers (see drawing 2).

The double flanged seam gives an exceptional power to the connection between steel and fabric. The double flanged seam is used in each type of **DEC CONNECTOR**.

Another advantage is the extraordinary protection the double flanged seam is giving to the fabric. It can be shaped easily by bending and the open flanged seam prevents the damaging of the fabric.

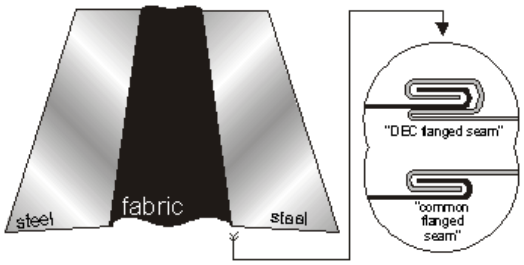


GALVANIZED STEEL.
The galvanized steel in the **DEC CONNECTOR** meets the demands of the following specifications:

- Thickness of plate : 400 microns
- Thickness tolerance : -50/+50 microns
- Sinking weight : 275 gr/m^2
- Quality : STO2Z275
- Chromatic Reagenz : NA Quality IIA (fewer lead, so fewer pollution)

CHEMICAL RESISTANCE
This table indicates the chemical resistance of galvanized steel in relation to different chemicals. It is just a restricted summary. For more information about the resistance to, not mentioned chemicals, please contact our sales team.

Chemicals	x	3	2	1
Acetone				✔
Acetylene				✔
Ammonia	✔			
Benzene				✔
Bromide	✔			
Butane				✔
Chlorine	✔			
Ethane				✔
Phenol	✔			
Phosphoric acid	✔			
Helium				✔
Carbon dioxide			✔	
Carbon dioxide (liquid)	✔			
Methane	✔			
Methanol				✔
Toluene				✔
Neon				✔
Ozone	✔			
Nitric acid (diluted)	✔			
Nitrogen				✔
Water			✔	
Water vapour				✔
Hydrogen				✔
Hydrochloric 37% cold	✔			
Hydrochloric 37% warm	✔			
Sulphur				✔
Sulphuric acid, diluted				✔
Sulphurous acid				✔



Explanation:

1 = excellent
2 = good
3 = moderated
x = poor/not recommended

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2.100 DEC CONNECTOR Fixing and Sealing

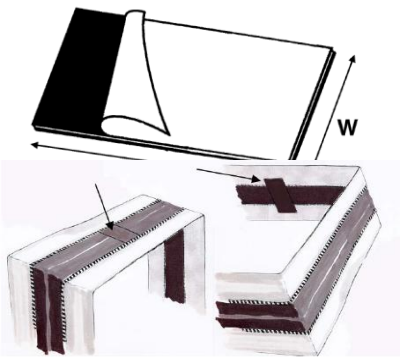
To select the appropriate **DEC CONNECTOR** products consult the table below.

	Vinyl	Polyurethane	Silicone	Neoprene
Mechanical data				
Specific gravity (gr/m^2)	600	450	550	570
Temperature range (°C)	-30 - +70	-50 - +200	-40 - +280	-20 - +100
Max. temperature (°C)	-	400 – **2h**	-	-
Fire class				
France (CSTB)	x	*M0	M1-M0	M1
Great Britain (BS 476)	x	Part 7 Class1	Part 7 Class1	Part 7 Class1
Technical data				
Fabric	see product specific properties			
Colour	dark grey	silver	silver	black
Chemical Resistance				
Acetone	••	▪	••	••
Acetylene	••	x	••	••
Ammonia	•	x	•	x
Benzene	••	••	▪	•
Butane	•	•	▪	•
Chlorine	•••	▪	▪	•••
Chlorine gas	▪	▪	x	▪
Ethane	••	•••	▪	••
Phenol	▪	▪	▪	▪
Phosphoric acid	••	•	▪	••
Helium	•	•	•	•
Carbon dioxide	•	x	••	••
Carbon dioxide (liquid)	▪	▪	▪	▪
Methane	••	•	▪	••
Methanol	•	▪	•	•
Toluene	▪	▪	▪	x
Neon	•	•	•	•
Ozone	•••	•	•	•••
Nitric acid (diluted)	•	•••	••	•
Nitrogen	•	•	•	•
Water	•	•	•	•
Water vapour	▪	▪	▪	▪
Hydrogen	••	x	▪	••
Hydrochloric 37% (cold)	••	▪	••	••
Hydrochloric 37% (warm)	▪	▪	▪	▪
Sulphur	•	x	•	•
Sulphuric acid (diluted)	••	•••	▪	••
Sulphurous acid	••	▪	▪	••

x = not been tested • = excellent •• = good ••• = moderate ▪ = poor/not recommended

Self-Adhesive Fabric Pads
The easy patch for our DEC Connector.
Seals the place of connection tight.

Code	Fabric Type	Dimensions W x L	Packaging
HCPA106	**RO-Robust (PVC-Vinyl)**	50x60mm	100 pcs / box
HCPA 110		50x100mm	100 pcs / box
HCPA 114		50x140mm	100 pcs / box
HCPA 206	**EO-Neoprene**	50x60mm	100 pcs / box
HCPA 210		50x100mm	100 pcs / box
HCPA 214		50x140mm	100 pcs / box
HCPA 001	Double sided adhesive only	Rolls 50mm x 50m	



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2.110 QIP - METAL CLAMPS Fixing and Sealing

The **METAL CLAMP** is appropriate to mounting all kinds of flexible ducts.

CONSTRUCTION

The **METAL CLAMP** has been constructed according to the DIN 3017 standards.
The strip has been manufactured out of stainless steel
(UNI x 8 Cr 17-DIN 1.4016(W2) - AISI 430).

The clamp has been manufactured out of hardened galvanized steel.

DELIVERY PROGRAM

METAL CLAMPS are available in a box containing 100pcs.
The diameter range is 50 to 660mm.
Ordering Code: **QIP [maximum diameter]**

SUMMARY OF THE DELIVERY PROGRAM

Ordering code	Minimum diameter (mm)	Maximum diameter (mm)
QIP090	50	90
QIP110	60	110
QIP135	60	135
QIP165	60	165
QIP180	60	180
QIP215	60	215
QIP270	60	270
QIP325	60	325
QIP380	60	380
QIP525	60	525
QIP560	60	560
QIP660	60	660

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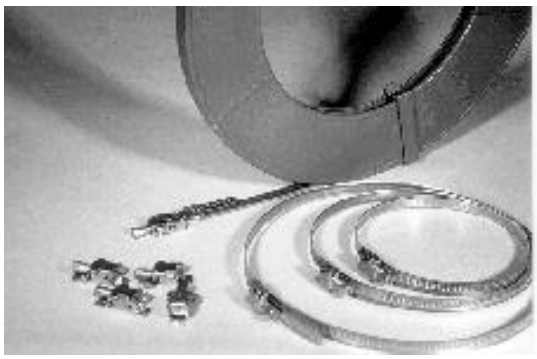
2.120 MULTIBAND-MULTICLAMPS

Fixing and Sealing

The **MULTIBAND/MULTICLAMPS** are suitable for mounting all types of flexible connections.
The combination **MULTIBAND/MULTICLAMP** enables you to making a clamp with diameters required at the work station.
The **MULTIBAND/MULTICLAMP** is particularly suitable for maintenance purposes.

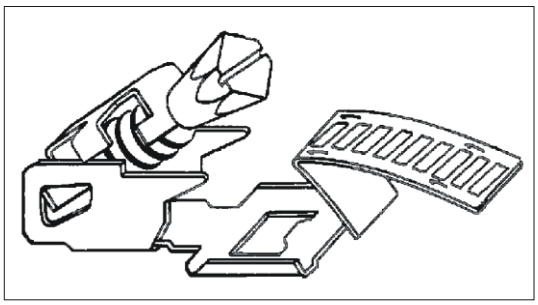
CONSTRUCTION
The **MULTIBAND** has been constructed according to the DIN 3017 standard. The band has been manufactured out of stainless steel (UNIx8Cr17-DIN 1.4016(W2)-AISI 430) and the thickness is 0.6mm.
The clamps, **MULTICLAMPS**, have been manufactured out of galvanized steel.



INSTRUCTIONS FOR USE
To obtain the **MULTIBAND** in the diameter required:

1. Extract the strip from the bos and count the intervals between the arrow indicators (see diameter extension table)
2. Cut the strip and bend 2 cm (3/4") in the direction of the arrow
3. Fasten the strip to the traction device and press the bend

The **MULTIBAND** is ready for installation



DELIVERY PROGRAM
MULTIBAND is available in cartons containing 10 rolls. The diameter range is variable.
The length of the **MULTIBAND** is 30m and the width is 9mm.

The **MULTICLAMPS** are suitable for fastening on the **MULTIBAND.**
MULTICLAMPS are delivered in boxes, containing 10 cartons with 50 pieces each.

Ordering code for **MULTIBAND: QIPBAND**

Ordering code for **MULTICLAMPS: QIPCLAMP**

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2.130 QCLX - NYLON QUICK CLAMPS

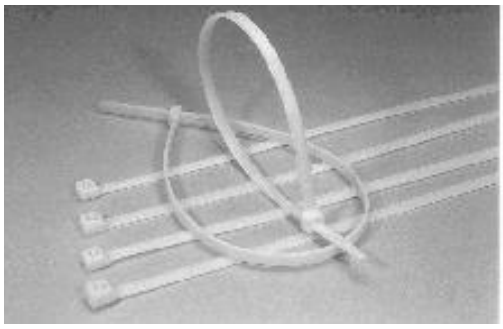
Fixing and Sealing

The **NYLON QUICK CLAMPS** are suitable for all kinds of flexible connections.

CONSTRUCTION

The **NYLON QUICK CLAMPS** are manufactured out of nylon 66. Production according to the Military Specification: MIL-S 23190E.

NYLON QUICK CLAMPS are available in different standard sizes; the range is 2.5 up to and including 9.0mm. The diameter range is 0 up to 229mm.



OPERATING TEMPERATURE

NYLON QUICK CLAMPS are suitable for applications within the following temperature range: -40 up to +85°C

DEC delivers assembly pliers particularly for the **NYLON QUICK CLAMPS**. The assembly pliers have a long lifespan and simplify the application of the **NYLON QUICK CLAMPS**. They are sold by the piece.

ORDERING INFORMATION

Article code:
NYLON QUICK CLAMP: QCLX (length in mm)/ {width}
QUICK CLAMP TOOL: QCLOOTA

Summary of the delivery program:

Ordering code	Diameter range (mm) min-gross/net[1)]	Width (mm)
QCL100/2.5	0 - 30 / 22.6	2.5
QCL160/2.5	0 - 50 / 41.4	2.5
QCL200	0 - 50 / 54.1	4.8
QCL200/2.5	0 - 60 / 52.5	2.5
QCL300	0 - 75 / 85.9	4.8
QCL370	0 - 110 / 106.6	4.8
QCL450	0 - 127 / 127.3	9.0
QCL530	0 - 140 / 152.3	9.0
QCL780	0 - 229 / 234.0	9.0

[1)] The diameter range has been stated as a minimum diameter, which is 0 millimeters everywhere.
The gross diameter has also been given. The net diameter is the diameter, which, in practice, appears to be the maximum diameter.

Note: Nylon (polyamide) is inherently sensitive to environmental factors. The ties are wetted after manufacture for optimum performance and must be stored in a cool dry area where they are not directly exposed to sunlight. The ties are packed in plastic bags to keep them moist and the bags must remain closed until the ties are ready for use.
The manufacturer is not liable for consequences caused by not following these rules.

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2.140 SB(R) - SPIRAL BENDS Fixing and Sealing

SPIRAL BENDS are appropriate to suspending round duct systems etc.

CONSTRUCTION
The **SPIRAL BENDS** have been manufactured out of Sendzimir galvanized steel and have a fixed diameter. The threaded rod can be attached to the nut welded on the top of the clamp.
The nut is able to processing forces up to 1000 kg.

The **SPIRAL BENDS** are also available with a rubber inner jacket. The rubber inner jacket prevents relaying of vibrations.

ORDER INFORMATION
The order code of the spiral clamps, without a rubber inner jacket:
SBO{diameter}

The order code of the spiral clamps with a rubber inner jacket:
SB*RO*{diameter}

Order code	Diameter (mm)	Thread size welded nut
SB*(R)*O080	80	M8
SB*(R)*O100	100	M8
SB*(R)*O125	125	M8
SB*(R)*O150	150	M8
SB*(R)*O160	160	M8
SB*(R)*O180	180	M8
SB*(R)*O200	200	M8

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2.150 SCR - SELFDRILLING SCREWS

Fixing and Sealing

DEC also introduces an assortment of **SELF-DRILLING SCREWS** in order to process **DEC** products.

CONSTRUCTION
The screws have been produced out of galvanized steel. The screw thread continues up to the head. The tail of the screw has been provided with a drill head. So pre-drilling is not necessary.
- Carbon steel
- Hardened
- Drill point
- Cr+3 Zinc plating (free of hexavalent chromium)

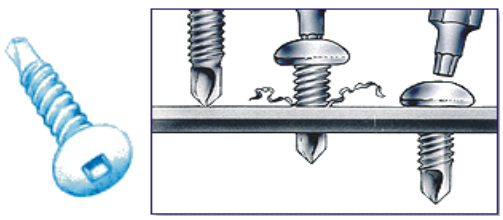
Guidelines for installation:
- Self-drilling screws are designed to perform best when driven at 1800 to 2500 R.P.M.
- Overdriving may result in torsion failure of screws or strip out of the fastening grip.
- The screw must penetrate beyond the metal structure a minimum of 3 threads.

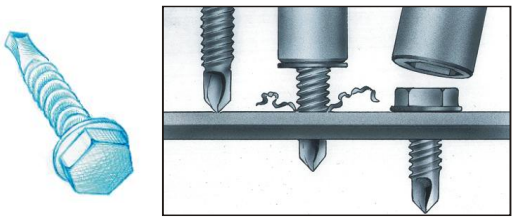
DELIVERY PROGRAM
The **self-drilling screws** are available in different sizes. Associated bits are also available.
Each 1000 screws 1 bit.

ORDERING INFORMATION
DEC's delivery program includes the following **self-drilling screws** and **bits**

Ordering code	Sizes (mmxmm)	Max. thickness of plate
SCR3.5/13	3.5 x 13	2.5 mm
SCR3.5/9.5	3.5 x 9.5	2.5 mm
SCR4.2/16	4.2 x 16	2.5 mm
SCR4.2/19	4.2 x 19	2.5 mm
SCR4.2/25	4.2 x 16	2.5 mm
SCR4.2/32	4.2 x 19	2.5 mm
SCR4.2/40	4.2 x 40	2.5 mm
SCR4.2/50	4.2 x 50	2.5 mm
SCR4.8/16	4.8 x 16	4.5 mm
SCR4.8/19	4.8 x 19	4.5 mm
SCR4.8/25	4.8 x 25	4.5 mm
SCR.BIT1 (no.1)	3.5mm	Irrelevant
SCR.BIT (no.2)	4.2/4.8mm	Irrelevant

Hexagonal washer head DIN 7504 K		
Ordering code	**Sizes (mmxmm)**	**Max. thickness of plate**
SCRDPM4.2/13	4.2 x 13	2.3 mm
SCRDPM4.2/16	4.2 x 16	3.4 mm
SCRDPM4.2/19	4.2 x 19	3.4 mm
SCRDPM4.8/16	4.8 x 16	3.4 mm
SCRDPM4.8/19	4.8 x 19	3.4 mm
		Length (L)
SCR.DPM.BIT7	7 mm (4.2)	42/45mm
SCR.DPM.BIT8	8 mm (4.2)	42/45mm
SCR.DPM.BITLONG7	7 mm (4.8)	65mm
SCR.DPM.BITLONG8	8 mm (4.8)	65mm





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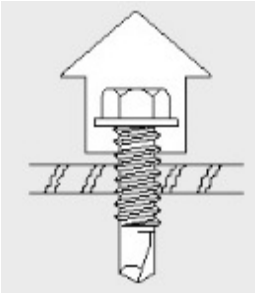
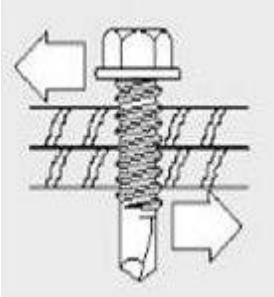
2.150 SCR - SELFDRILLING SCREWS

Fixing and Sealing



Pull-out



Shear

Screw Dia.	Steel Sheet Thickness	Tension Pull-out	Shear (two sheets overlap)	Drill & Tapping capacity	Screw values Tensile	Shear	Torqu
3.5mm	0.9mm	110 kg	320 kg	0.80-2.50mm	5 kN	3.3 kN	2.8 kN
	1.2mm	170 kg	370 kg	0.80-2.50mm			
	1.5mm	210 kg	380 kg	0.80-2.50mm			
	1.9mm	380 kg	400 kg	0.80-2.50mm			
4.2mm	0.9mm	120 kg	330 kg	0.80-2.50mm	7 kN	4.4 kN	4.7 kN
	1.2mm	180 kg	390 kg	0.80-2.50mm			
	1.5mm	210 kg	450 kg	0.80-2.50mm			
	1.9mm	400 kg	460 kg	0.80-2.50mm			
4.8mm	0.9mm	150 kg	370 kg	0.80-4.50mm	10 kN	6.6 kN	7.3 kN
	1.2mm	240 kg	540 kg	0.80-4.50mm			
	1.5mm	310 kg	600 kg	0.80-4.50mm			
	1.9mm	430 kg	640 kg	0.80-4.50mm			

The values listed are ultimate averages achieved under standard laboratory conditions. These results are given only as a guide and not as a warranty. An appropriate safety factor must be determined for the designed purpose.

Information contained herein is based on careful tests and experience. It reflects our knowledge and is for guidance purpose only. Manufacturer and distributor are not responsible for any non-recommended use or consequential damage. Before any application, ensure that the product is fit for purpose.

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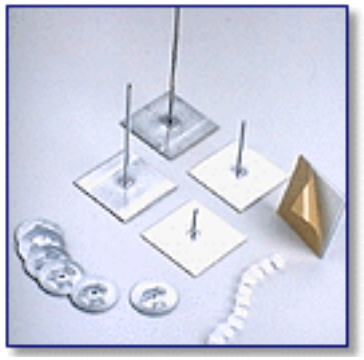
2.160 PINSA - SELFADHESIVE PINS

Fixing and Sealing

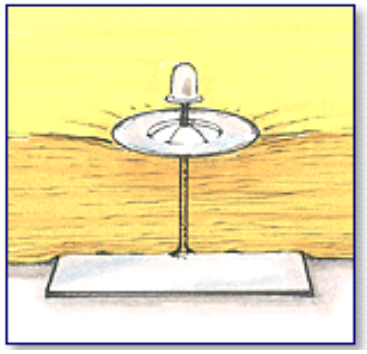
SELF-ADHESIVE PINS (PINSA) are suitable for fastening insulation blankets.

CONSTRUCTION
The **PINSA** has been manufactured out of galvanized steel. The **PINSA** consists of a pin and a foot. The foot has been provided with a synthetic rubber tack coat. Clamps can be delivered with the pins. The clamp is going to be fastened to the **PINSA** after attaching the insalation blanket. In consequence of this the blanket will stay in the correct position.

The foot has the following size: 50x50 mm. Each square metre of insulation blanket needs 10 to 12 pins.

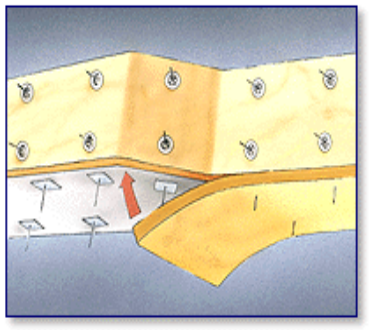


SAFETY
Protective caps (**PINSACAP**) for attacing round the pin are available to the pins. The use of **PINSACAP** is always recommended where people can be injured by projecting pins.



OPERATING TEMPERATURE
The self-adhesive pins are suitable within the following temperature range: -40°C to + 80°C (100°C for short period of time).
The processing, however, has to take place above +10°C.

FASTENING
The best result will be achieved on a dry, fat-free and dust-free surface.



ORDERING INFORMATION
The caps will automatically be delivered to the pins, but it is also possible to order the protective caps separately (**PINSACAP).**
Extra clamps (**PINSACLIP)** are available as well.

Ordering code	Length of pins
PINSA025	25 mm
PINSA032	32 mm
PINSA042	42 mm
PINSA051	51 mm
PINSA063	63 mm
PINSA076	76 mm
PINSA105	105 mm
PINSACLIP	-
PINSACAP	-

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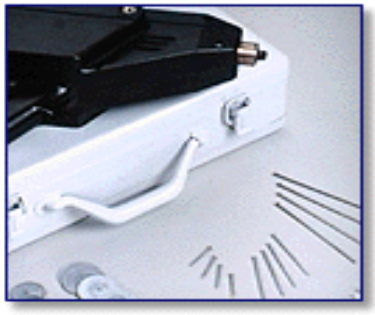
2.170 SP - Welding PINS Fixing and Sealing

WELDING PINS (SP) are, like the self adhesive pins (**PINSA**), suitable for fastening insulation blankets to square or rectangular air ducts. The pins can also be used for round and oval ducts.

CONSTRUCTION

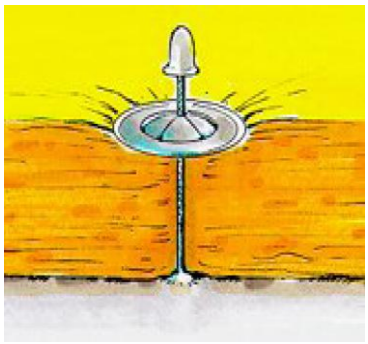
The pins have been manufactured out of copper plated steel and provided with a soldering side at the end. Washers will be delivered with the pins. After attaching the insulation blanket the clamps will be fastened to the pins. This will keep the blanket in the correct position. Protective nylon caps are recommended where projecting pins can injure people.
For each square metre of insulation blanket 10 - 12 pins will be needed.



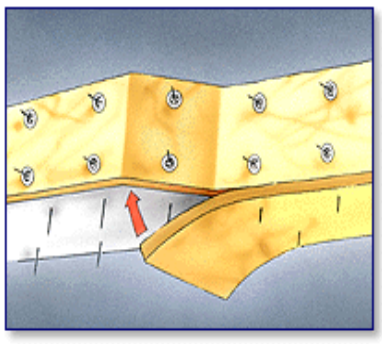
The soldering side will be activated with a pin welder (**PW-33**). This pin welder enables to attach 6 - 8 pins per minute. Because the pin welder is provided with a timer it is no need to control the soldering time. The timer can be adjusted to the material of the duct system.
(CE Welding machine in accordance with European Union norms and directives.)

ORDERING INFORMATION.

It is possible to order protecting caps **(SP-CAP)** to the WELDING PINS and the clamps. Other special washers **(CL-0)** can be ordered.



Ordering code	Length pins
SP-25	25 mm
SP-32	32 mm
SP-42	42 mm
SP-51	51 mm
SP-63	63 mm
SP-76	76 mm
SP-105	105 mm
CL- 0	-
SP-CAP	-
PW-33	-



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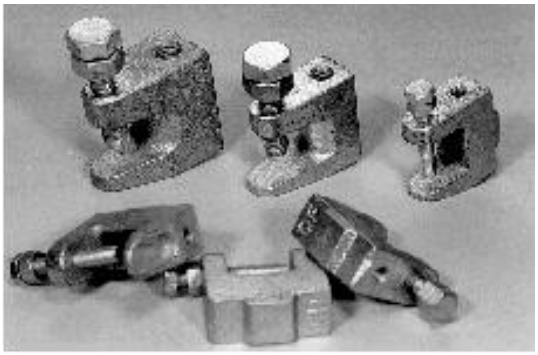
2.180 BLK - SUPPORT CLAMPS Fixing and Sealing

SUPPORT CLAMPS are suitable for mounting various parts of air conditioning systems and exhaust systems on structural beams in combination with threaded ends. It is used where drilling is not allowed or too time-consuming.

CONSTRUCTION
The **SUPPORT CLAMPS** are manufactured out of galvanized steel. The clamps can be fastened on beams with a maximum thickness of 19mm.

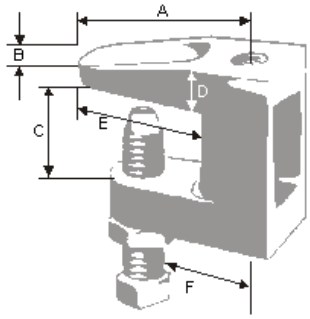
ORDERING INFORMATION.
The **SUPPORT CLAMPS** are appropriate to M6 up to M12 threaded ends.

ORDERING CODE: BLKO[wire spacing]



TECHNICAL DATA

Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Tested loading	Recomm. loading
BLK006	26	13	22	10	20	18	620 kg	90
BLK008	26	13	22	10	20	18	680 kg	110
BLK010	41	13	19	10	28	25.5	680 kg	110
BLK012	41	18	19	13	26	25.5	1725 kg	340



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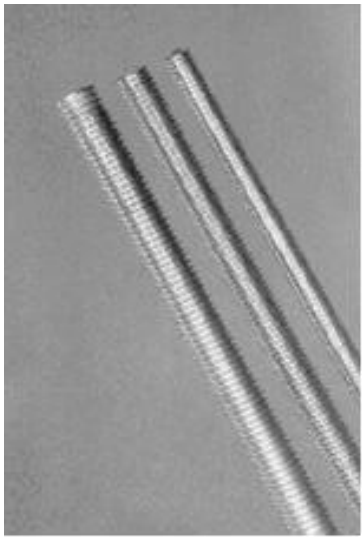
2.190 THREADED RODS Fixing and Sealing

THREADED RODS are suitable for mounting several fasteners for air ducts and flexible ducts. The threaded ends can be applied in combination with **SPIRAL CLAMPS** or **SUPPORT CLAMPS**.

CONSTRUCTION
The **THREADED RODS** have been manufactured out of electrolytically galvanized steel, class 4.6.



ORDERING INFORMATION
The **THREADED RODS** are deliverable in a one meter standard length, other lengths on request.

The order code has been constructed out of: **[wire gauge]/length**.

Ordering code	Wire gauge x length
M6/1	M6 x 1 meter
M8/1	M8 x 1 meter
M10/1	M10 x 1 meter
M12/1	M12 x 1 meter
M16/1	M16 x 1 meter

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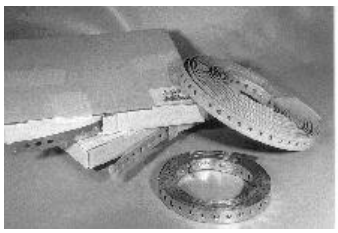
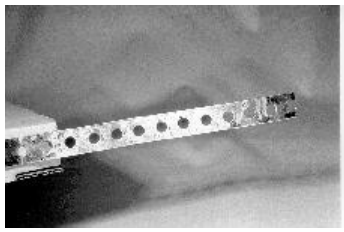
2.200 SUSPENSION STRAP Fixing and Sealing

SUSPENSION STRAP is a flexible multifunctional perforated strap for mounting various parts in air conditioning and ventilation systems.

CONSTRUCTION
SUSPENSION STRAP is available in 2 different versions, galvanized and copolymer coated. The **SUSPENSION STRAP** with the copolymer coating is preferable for systems, which can be damaged by sliding or swinging. The **SUSPENSION STRAP** is provided with holes for mounting, the holes enable to processing various diameters.





ORDER INFORMATION
SUSPENSION STRAP is available in two linear measures: 10 and 20 meters. The width is 17 or 19 mm. **SUSPENSION STRAP** is available in boxes or on rolls.

The ordering code is:
Copolymer coated suspension strap, 10 meters: **PP019S**
Copolymer coated suspension strap, 20 meters: **PP019/BOX**
Galvanized suspension strap, 10 meters: **PZ017S**
Galvanized suspension strap, 20 meters: **PZ017/BOX**

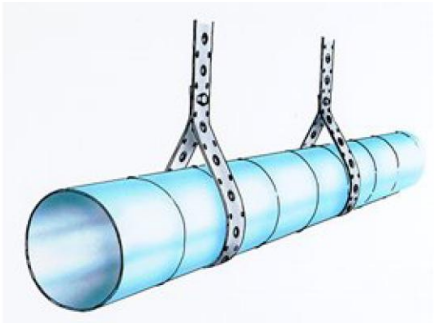
Ordering code	Version	Width x length	Thickness	Packaging	Size holes
PP019S	Copolymer coated	19 mm x 10 m	1 mm	Rolls	M6
PP019/BOX	Copolymer coated	19 mm x 20 m	1 mm	Box	M6
PZ017S	Galvanized	17 mm x 10 m	0.7 mm	Rolls	6.8mm + 3.5mm
PZ017/BOX	Galvanized	17 mm x 20 m	0.7 mm	Box	6.8mm + 3.5mm

The New **SUSPENSION STRAP** is a flexible multifunctional perforated strap for mounting various parts in air conditioning and ventilation systems.

- Galvanised steel
- 25 m per roll (others on request)
- Supplied in bundles of 5 rolls

Perforated suspension band – bundles of 5 rolls

Code	Width	Thickness	Holes details	
			Large	Small
PZ176OV	17 mm	0,6 mm	Oval 6,5x12mm	Dia. 3,3mm
PZ176RD	17 mm	0,6 mm	Round 8,5mm	Dia. 4,2mm
PZ206RD	20 mm	0,6 mm	Round 8,5mm	Dia. 4,2mm
PZ208RD	20 mm	0,75 mm	Round 8,5mm	Dia. 4,2mm
PZ258RD	25 mm	0,75 mm	Round 8,5mm	Dia. 4,2mm
PZ258OV	25 mm	0,75 mm	Oval 10,5x20mm	Dia. 3,3mm
PZ259OV	25 mm	0,90 mm	Oval 10,5x20mm	Dia. 3,3mm
PZK258OV	25 mm	0,75 mm	Oval 10,5x20mm	
PZK259OV	25 mm	0,90 mm	Oval 10,5x20mm	



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3.000 GENERAL INFORMATION VALVES
Air Management

	Plastic	Steel	Supply valve	Exhaust valve	Continuously adjustable	Stepwise adjustable	Spring connection	Screw connection
DVKR	✔		✔	✔	✔			✔
DAV	✔		✔	✔	✔		✔	
DDAVBR	✔		✔	✔	✔		✔	
DVLF	✔			✔	✔		✔	
DVLI	✔		✔		✔		✔	
DAB	✔		✔	✔		✔	✔	
DVS(Y)		✔		✔	✔			✔
DVSC		✔		✔	✔		✔	
DVS-P(Y)		✔	✔		✔			✔
DVSC-P		✔	✔		✔		✔	
DIRC		✔	✔	✔	✔		✔	
DSO/DSO-S		✔		✔	✔			✔
DSO-P		✔		✔	✔			✔
DTI		✔	✔		✔			✔
DTVK		✔	✔		✔		✔	
DLD		✔	✔	✔	✔			✔

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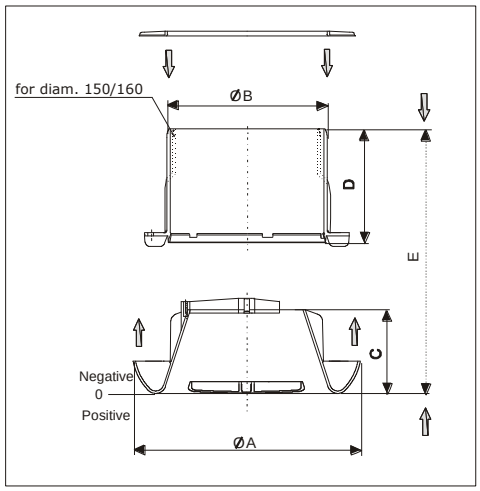
3.011 DVKR EXHAUST AIR VALVE
Air Management

TECHNICAL DATA

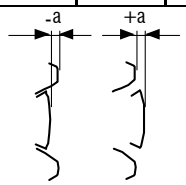
PRODUCT PROPERTIES
- Available in diameter 100, 125, 150/160 and 200 mm.
- Manufactured from white polypropylene (Ral 9010).
- The valve is difficult to ignite (Will not burn with open flame).
- The valve material has a melting point between 150-180 °C.
- The valve resist temperatures up to 110 °C without deformation.
- High valve body improving air flow/less noise.
- Closed disc.
- No leakage between valve body and connection bush.
- Connection bush also adapted for false ceiling panels.
- Variable volume flow control.
- Unique locking system between connection bush and valve body.
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom).
- Simple removal for cleaning



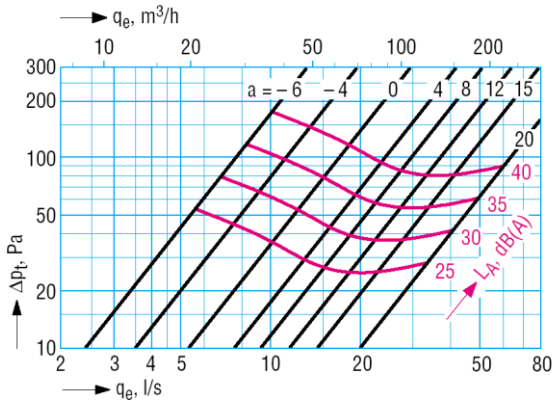
DIMENSIONS in mm

DVKR	A	B	C	D	E
100	141	99.5	52	70.5	84.5
125	167	124.5	52.5	70.5	84.5
150/160	202	149.5 / 159.5	52.5	70.5	84.5
200	240.3	199.5	52.0	70.5	84.5

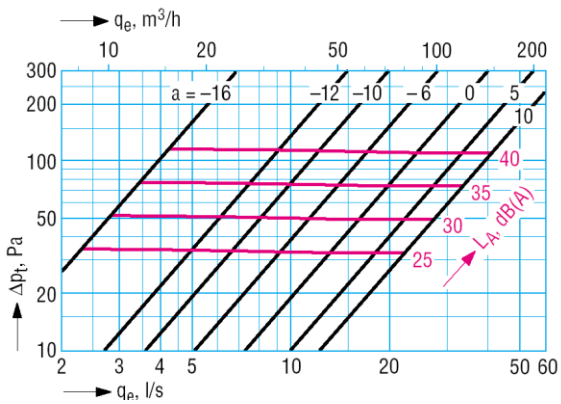
a = number of revolutions



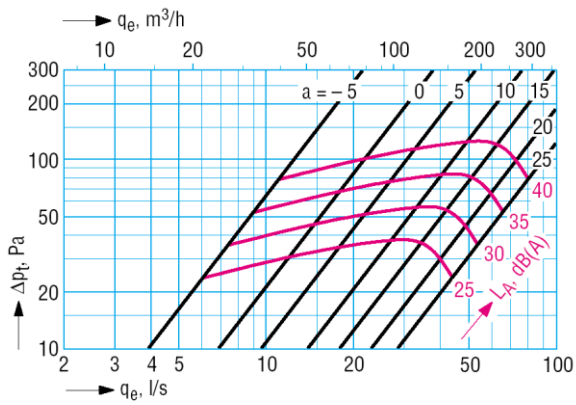
DVKR-100



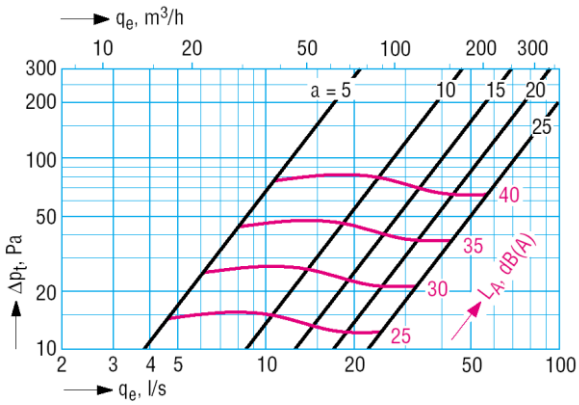
DVKR-125



DVKR-150/160



DVKR-200



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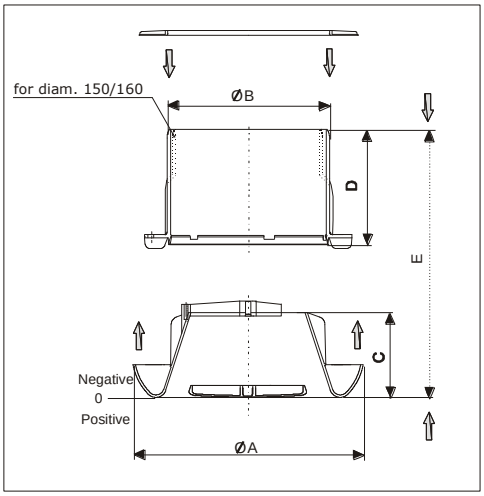
3.012 DVKR SUPPLY AIR VALVE

Air Management

TECHNICAL DATA

PRODUCT PROPERTIES

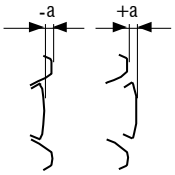
- Available in diameter 100, 125, 150/160 and 200 mm.
- Manufactured from white polypropylene (Ral 9010).
- The valve is difficult to ignite (Will not burn with open flame).
- The valve material has a melting point between 150-180 °C.
- The valve resist temperatures up to 110 °C without deformation.
- High valve body improving air flow/less noise.
- Closed disc.
- No leakage between valve body and connection bush.
- Connection bush also adapted for false ceiling panels.
- Variable volume flow control.
- Unique locking system between connection bush and valve body.
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom).
- Simple removal for cleaning

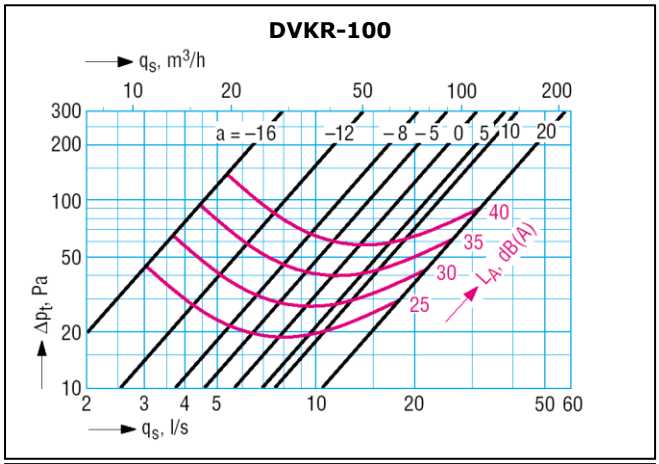


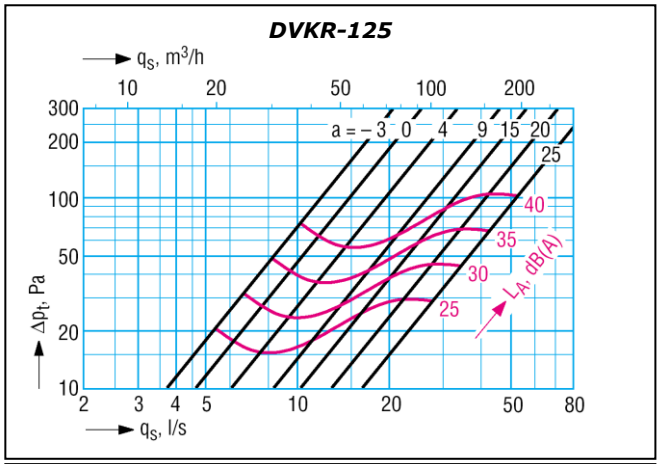
DIMENSIONS in mm

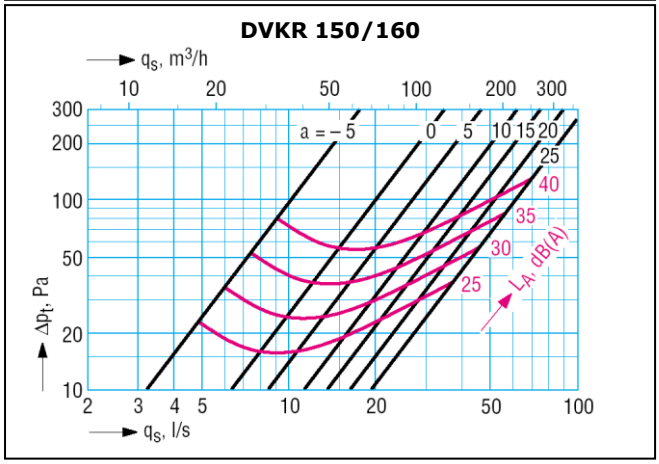
DVKR	A	B	C	D	E
100	141	99.5	52	70.5	84.5
125	167	124.5	52.5	70.5	84.5
150/160	202	149.5 / 159.5	52.5	70.5	84.5
200	240.3	199.5	52.0	70.5	84.5

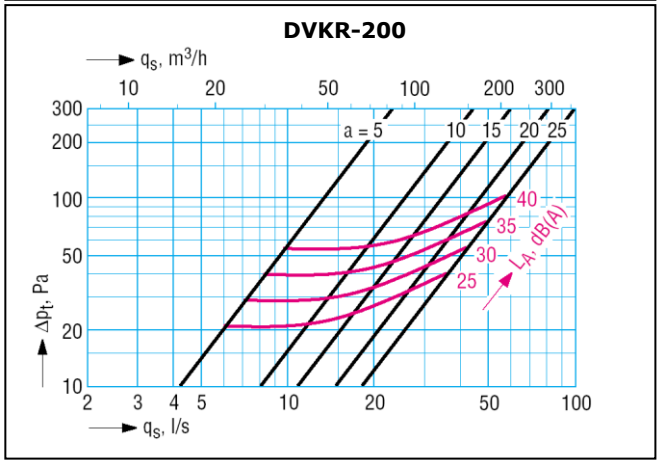
a = number of revolutions











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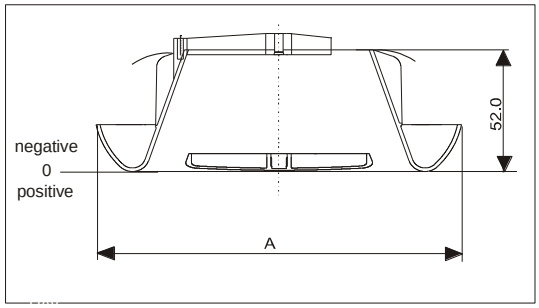
3.021 DAV EXHAUST AIR VALVE

Air Management

TECHNICAL DATA

PRODUCT PROPERTIES

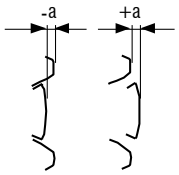
- Available in diameter 100, 125, 150/160 and 200 mm.
- Manufactured from white polypropylene (Ral 9010).
- The valve is difficult to ignite (Will not burn with open flame).
- The valve material has a melting point between 150-180 °C.
- The valve resist temperatures up to 110 °C without deformation.
- High valve body improving air flow/less noise with spring fastening.
- Closed disc.
- No leakage between valve body and connection bush.
- Connection bush also adapted for false ceiling panels.
- Variable volume flow control.
- Unique locking system between connection bush and valve body.
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom).
- Simple removal for cleaning



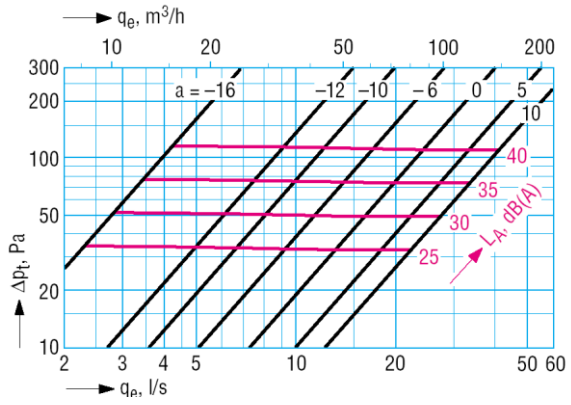
DIMENSIONS in mm

DAV	A Ø
100	141
125	167
150	202
160	202
200	240.3

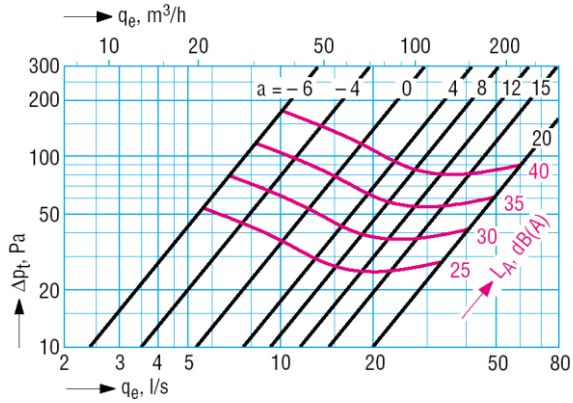
a = number of revolutions



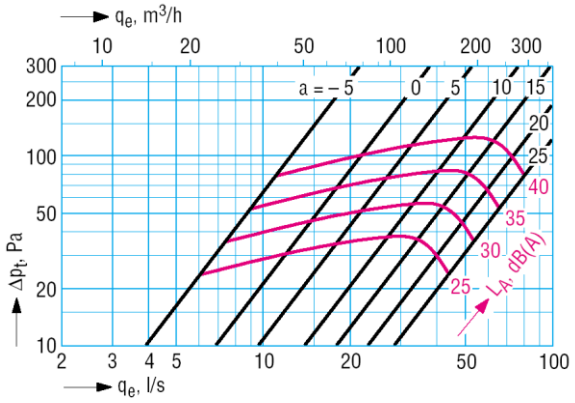
DAV 100



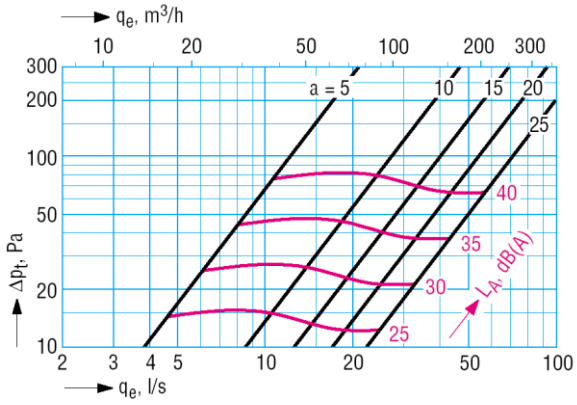
DAV 125



DAV 150/160



DAV 200



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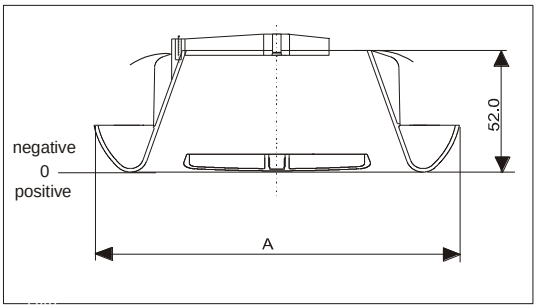
3.022 DAV SUPPLY AIR VALVE

Air Management

TECHNICAL DATA

PRODUCT PROPERTIES

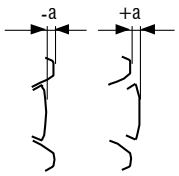
- Available in diameter 100, 125, 150/160 and 200 mm.
- Manufactured from white polypropylene (Ral 9010).
- The valve is difficult to ignite (Will not burn with open flame).
- The valve material has a melting point between 150-180 °C.
- The valve resist temperatures up to 110 °C without deformation.
- High valve body improving air flow/less noise with spring fastening.
- Closed disc.
- No leakage between valve body and connection bush.
- Connection bush also adapted for false ceiling panels.
- Variable volume flow control.
- Unique locking system between connection bush and valve body.
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom).
- Simple removal for cleaning



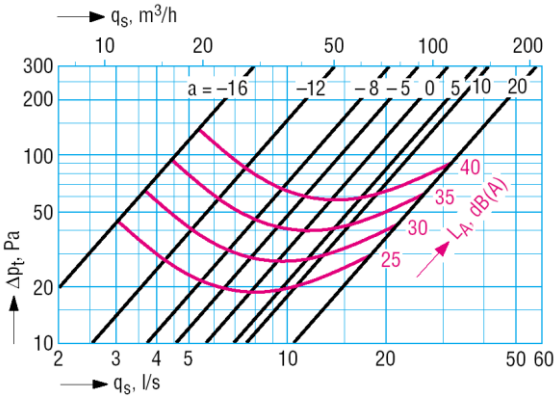
DIMENSIONS in mm

DAV	A Ø
100	141
125	167
150	202
160	202
200	240.3

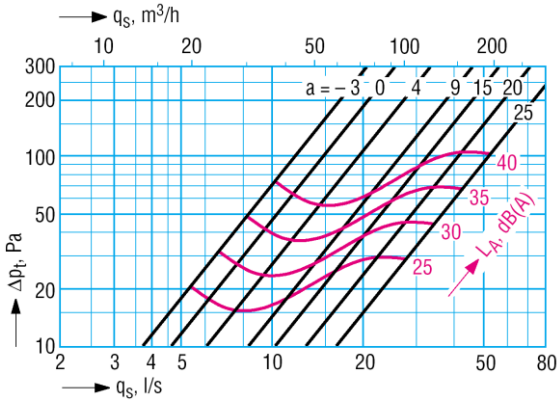
a = number of revolutions



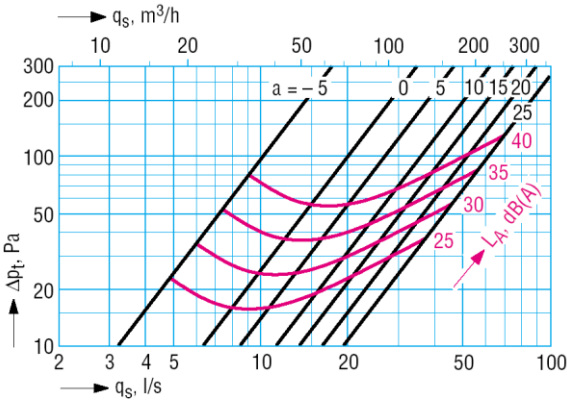
DAV100



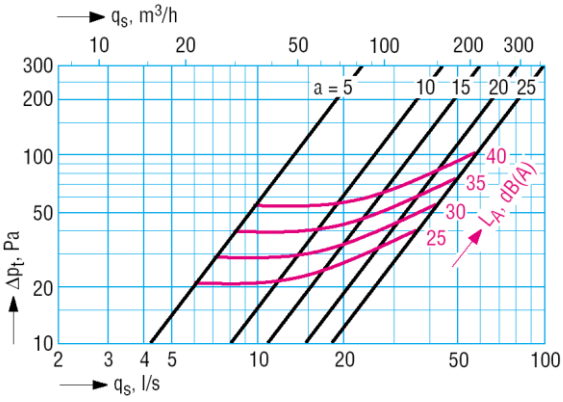
DAV125



DAV150/160



DAV200



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3.023 DDAVBR SUPPLY/EXHAUST AIR VALVE

Air Management

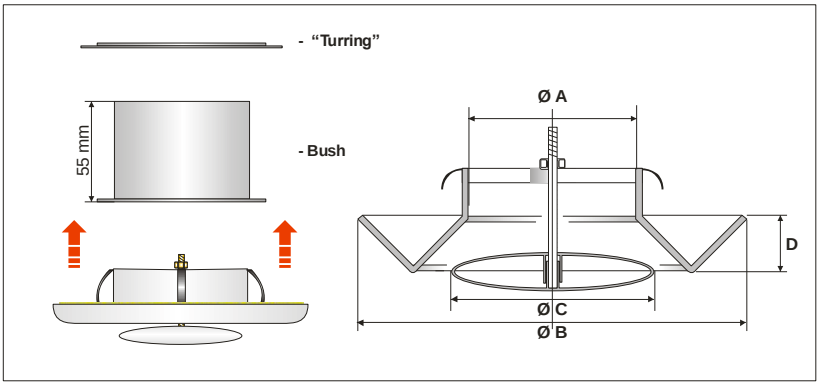
TECHNICAL DATA

PRODUCT PROPERTIES

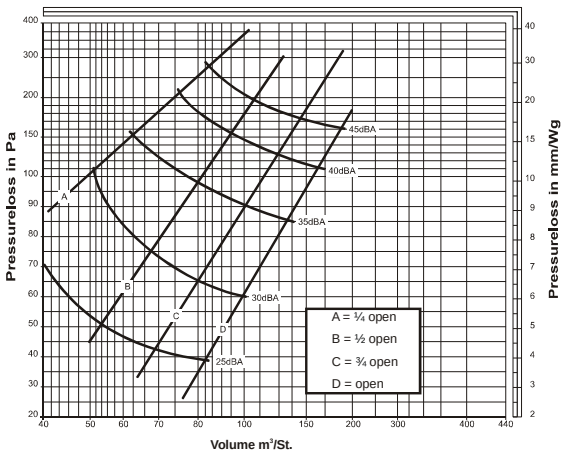
- Diameter 100, 125, 150 and 200 mm
- Manufactured from white polypropylene (RAL 9010)
- heat resistant to 100 ºC.
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom)
- No leakage between valve body and connection bush
- Variable volume flow control.
- High valve body improving air flow/less noise with spring fastening.
- For mounting in places with small space a turring in added.

DIMENSIONS in MM

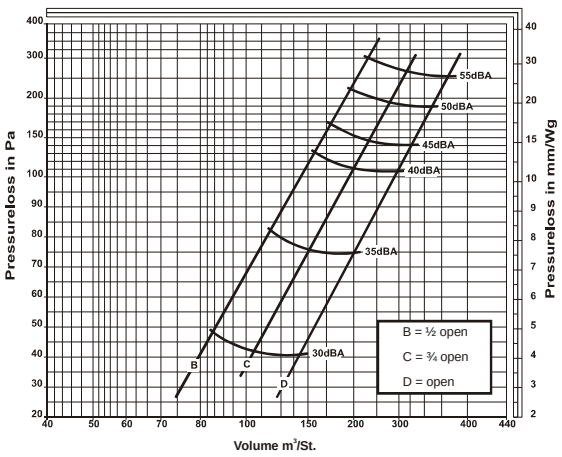
DAVBR	Ø 100	Ø 125	Ø 150	Ø 200
A	80	100	118	171
B	148	168	186	240
C	87	106	130	178
D	20	20	20	20



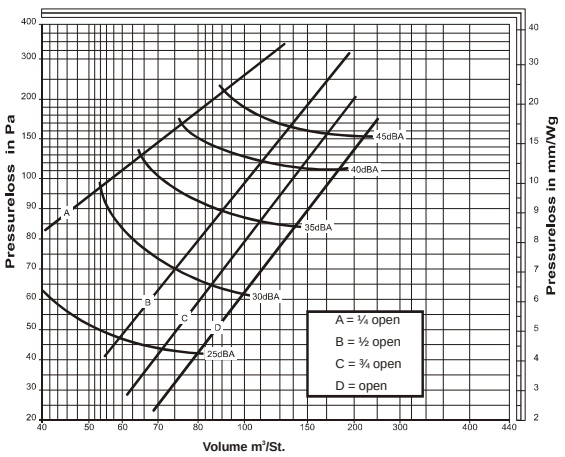
DDAVBR100



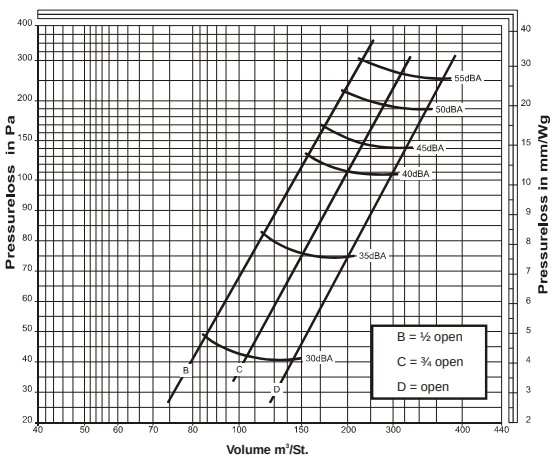
DDAVBR150



DDAVBR125



DDAVBR200



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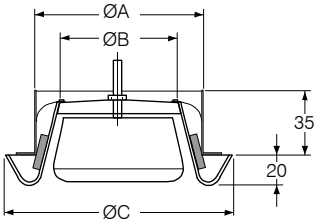
3.031 DVLF EXHAUST AIR VALVE

Air Management

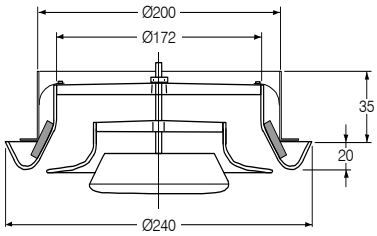
TECHNICAL DATA
PRODUCT PROPETIES

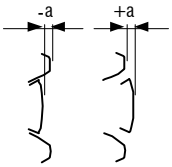
- Diameters 080, 100, 125, 160 and 200mm
- Max. 100 ºC
- Manufactured from white polypropylene (Ral 9002)
- High valve body improving air flow/less noise
- No leakage between valve body and connection bush
- Variable volume flow control
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom)

DVLF 80 – 160



DVLF 200





n = number of revolutions open
a = 0 +/- mm

DIMENSIONS in mm

Art. Code	A	B	C
DVLF-80	80 mm	45 mm	120 mm
DVLF-100	100 mm	70 mm	145 mm
DVLF-125	125 mm	95 mm	160 mm
DVLF-160	160 mm	115 mm	195 mm
DVLF-200	200 mm	172 mm	240 mm

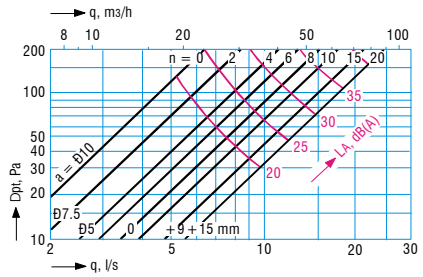
Adjustment

The cone is screwed out by the number of revolutions necesarry to provide the orifice opening in mm corresponding to the pressure drop and the desured air flow according to the graph. The pressure drop is checked by introducing a suitable measurement probe into the front behind the valve cone.

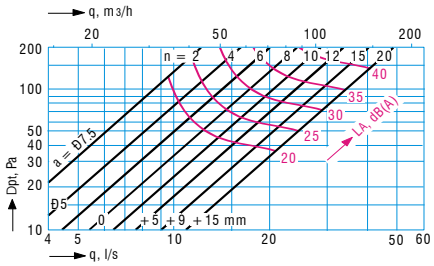
Size	a, mm	-7.5	-5	0	+5	+10	+15
DVLF-80	k-factor	0.53	0.73	0.95	1.10	1.25	1.43
DVLF-100		0.83	1.09	1.46	2.00	2.28	2.69
DVLF-125		0.85	1.11	1.63	2.15	2.41	3.45
Size	**a, mm**	**-2.5**	**0**	**+5**	**+10**	**+15**	**+20**
DVLF-160	k-factor	2.02	2.63	3.93	4.53	6.08	7.56
DVLF-200		-	3.47	4.61	5.97	6.60	7.66

$$q = k \sqrt{\Delta p_m}$$
(l/s) (Pa)

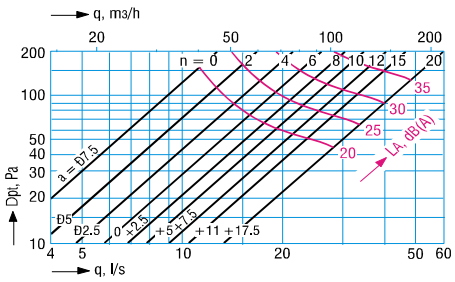
DVLF-080



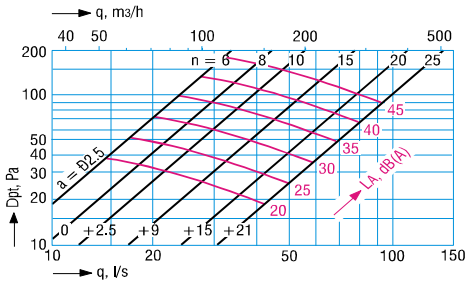
DVLF-100



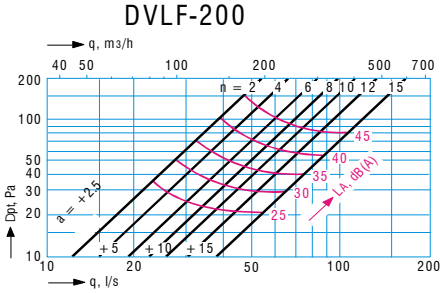
DVLF-125



DVLF-160



DVLF-200



Sound power level

Size	Correction of sound level in dB at 63	125	250	500	1000	2000	4000	8000 Hz
08	-8	-7	-5	-4	-1	-2	-5	-12
10	-7	-6	-6	-4	-2	-1	-4	-11
12	-6	-5	-3	-4	-2	-1	-4	-13
16	1	2	1	-1	1	-4	-9	-18
20	1	2	4	0	-1	-4	-10	-18

Sound attenuation

Size	Correction of sound level in dB at 63	125	250	500	1000	2000	4000	8000 Hz
08	23	23	16	15	13	10	6	9
10	22	21	15	13	11	10	6	9
12	21	19	13	11	10	10	7	9
16	20	16	12	10	9	10	8	8
20	17	12	7	5	4	4	7	5

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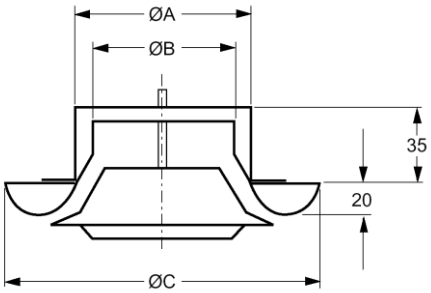
3.032 DVLI SUPPLY AIR VALVE

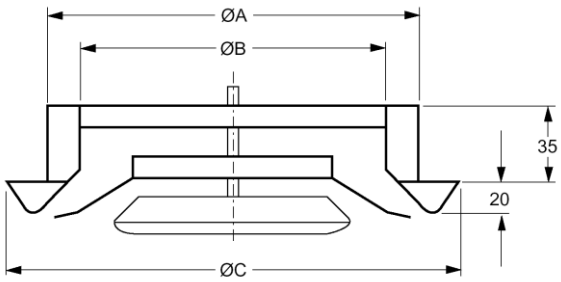
Air Management

TECHNICAL DATA
PRODUCT PROPETIES
- Diameters 080, 100, 125, 160 and 200mm
- Max. 100 ºC
- Manufactured from white polypropylene (Ral 9002)
- High valve body improving air flow/less noise
- No leakage between valve body and connection bush
- Variable volume flow control
- Suitable for rooms with a high air humidity (e.g. kitchen, bathroom)

DVLI 80 – 125



DVLI 160 – 200



DIMENSIONS in mm

Art. Code	A	B	C	Weight
DVLI -080	80 mm	46 mm	118 mm	0.09kg
DVLI -100	100 mm	80 mm	150 mm	0.15kg
DVLI -125	125 mm	96 mm	158 mm	0.16kg
DVLI -160	160 mm	115 mm	195 mm	0.23kg
DVLI -200	200 mm	163 mm	240 mm	0.34kg

Art. Code	Airflow l/s (m^3/h) at sound level		
	25dB(A)	30dB(A)	35dB(A)
DVLI -080	8	11 (40)	13
DVLI -100	16	19 (68)	23
DVLI -125	20	24 (86)	28
DVLI -160	32	38 (137)	46
DVLI -200	57	70 (252)	85

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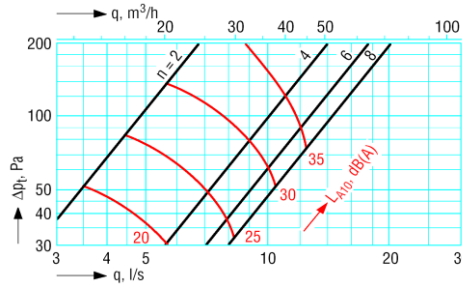
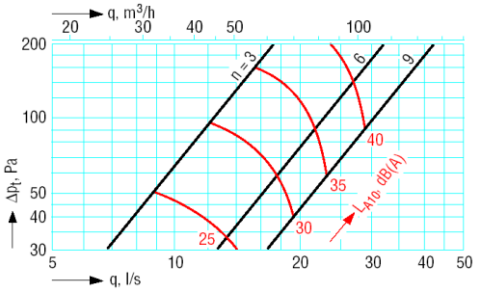
3.032 DVLI SUPPLY AIR VALVE

Air Management

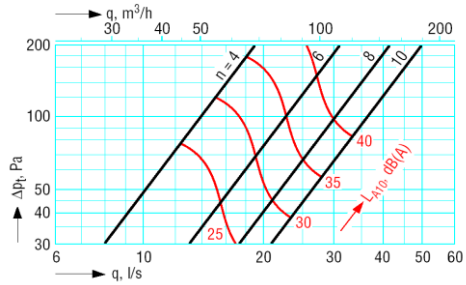
DVLI 80



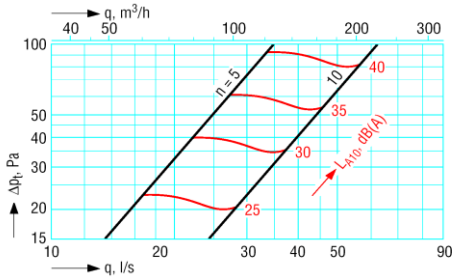
DVLI 100



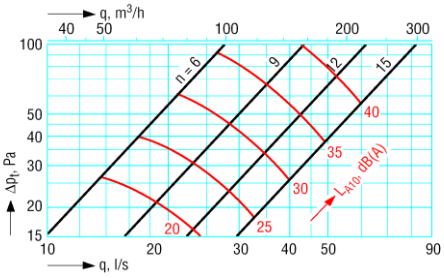
DVLI 125



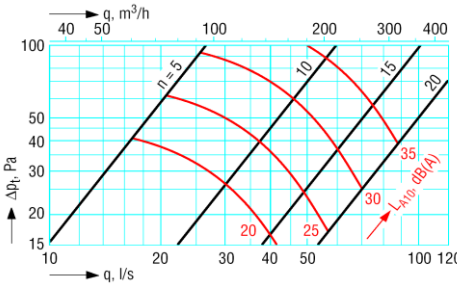
DVLI 160 inner slot open 5 rev. (6.25mm)



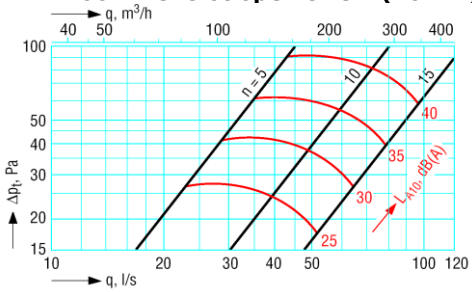
DVLI 160 inner slot closed



DVLI 200 inner slot closed



DVLI 200 inner slot open 8 rev. (10mm)



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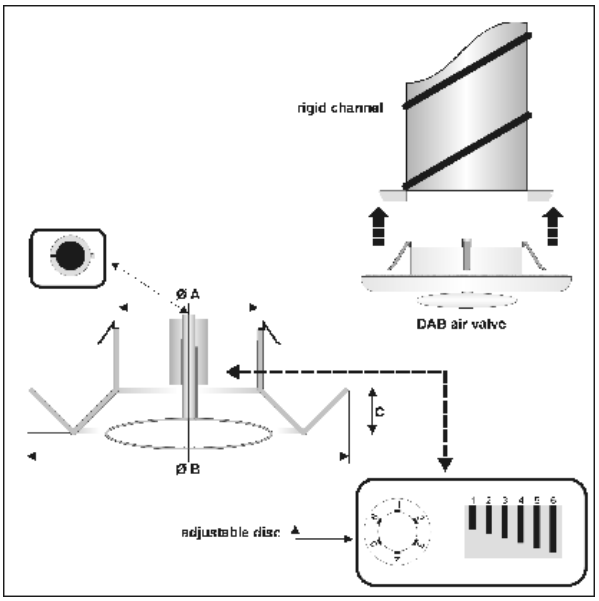
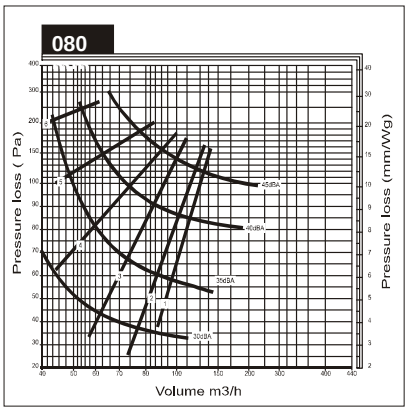
3.040 DAB AIR VALVE Air Management

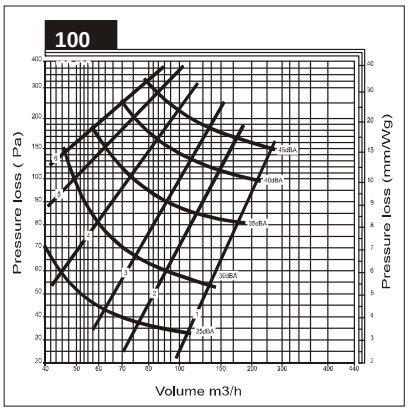
TECHNICAL DATA

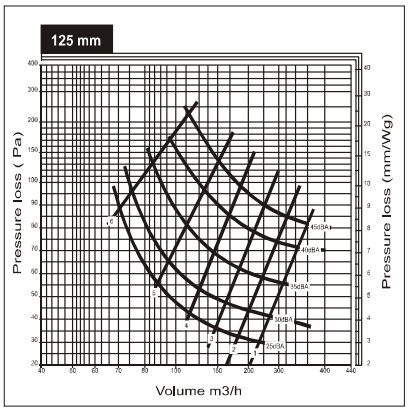
Plastic air valve with six-step adjustable disc and spring fastening.

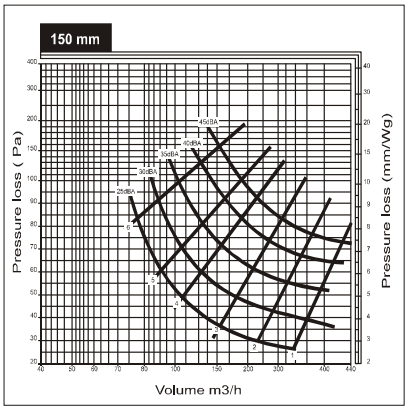
PRODUCT PROPETIES
- Diameter range 80, 100, 125, 150 and 160 mm
- Manufactured out of white polypropylen (RAL 9003) with a heat resistance up to 100 °C.
- Suitable for rooms with a higher air humidity (e.g. kitchen and bathroom).
- Easy to remove for cleaning purposes.
- Suitable for direct mounting in round, rigid ducts.
- Fast and simple to adjust by a six-step adjustable disc.
- The combination of sealing tape and spring fastening provides an optimal sealing.

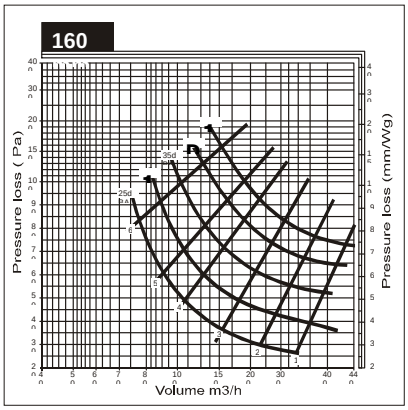












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3.041 DVI STAINLESS STEEL AIR VALVE

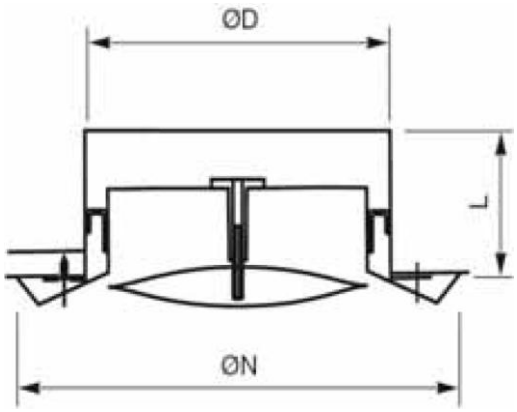
Air Management

Product Specifications

- Suitable for rooms with a high air humidity (e.g. Kitchen, bathroom)
- Diameter 100, 125, 160 and 200
- Manufactured from Brushed Stainless Steel
- Variable air flow control
- High valve body improving air flow/less noise with spring fastening
- Simple removal for cleaning
- Including Fixing collar with spring fastening

Article Number	Description	Qty Pack
DVI100	Valve Stainless Steel incl ring - 100mm	60
DVI125	Valve Stainless Steel incl ring - 125mm	30
DVI160	Valve Stainless Steel incl ring - 160mm	24
DVI200	Valvet Stainless Steel incl ring - 200mm	24

Article Number	Ø D [mm]	ØN	L	Qv (3 m/s) [m³/h]
DVI100	100	140	50	80
DVI125	125	170	50	130
DVI160	160	218	63	180
DVI200	200	298	80	220



Qv	Type	100	125	150	160	200
30	Ps	15				
	L'	0.2				
40	Ps	25	11			
	L'	0.4	0.3			
60	Ps	53	23	3	2	
	L'	0.7	0.4	0.3	0.2	
80	Ps	100	51	10	8	
	L'	1.2	0.7	0.5	0.4	
130	Ps		139	25	22	43
	L'		1.5	1	0.9	1.1
190	Ps			56	48	56
	L'			1.8	1.6	1.6
220	Ps					114
	L'					2

Remarks
Qv =Air ol me in m³/h
L' = Horizontal throw in m at end velocity

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3.042 **DVSR/DVIR** air supply valves
Air Management

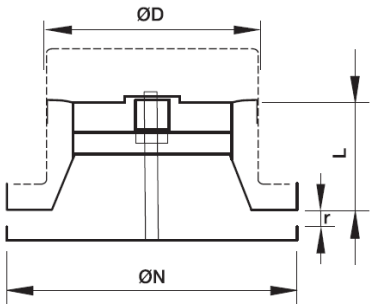
Product Specifications
Steel Air supply valve with adjustable core

Application
For air supply in ventilation systems

Material
Steel White, RAL 9010 or Brushed Stainless steel

Composition
Pressed steel body with adjustable core,
supplied with galvanized steel mounting frame

Mounting
Fixing by clips in the mounting frame
Can also be used for direct mounting into round ducts (with or without mounting frame)

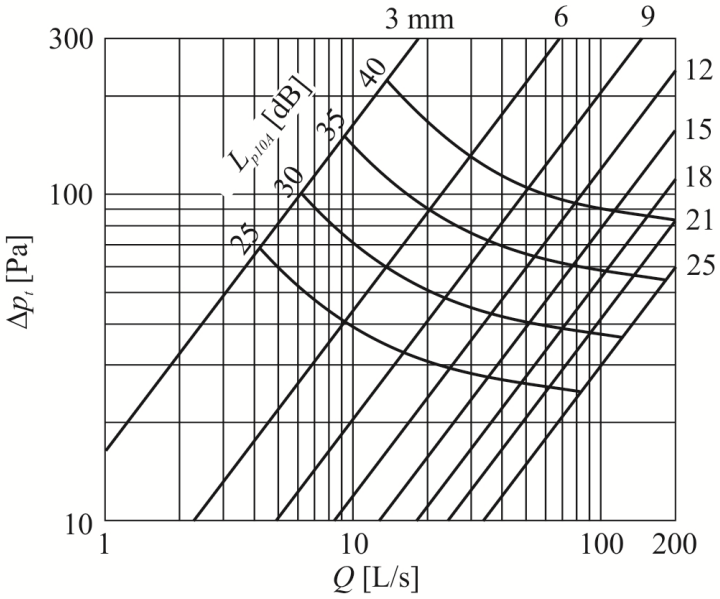


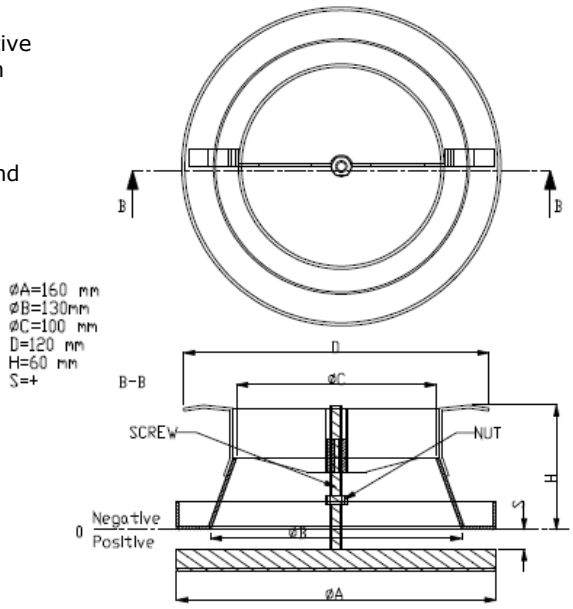
ØD (mm)	ØN (mm)	L (mm)
080	106	60
100	135	60
125	160	60
160	195	60
200	238	63

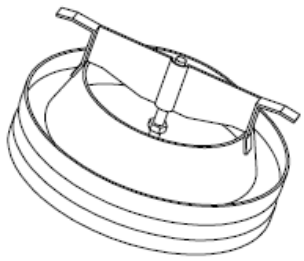
Also available as Stainless steel
DVIR100 - Supply Air Valve Round Brushed STAINLESS STEEL 100 MM
DVIR125 - Supply Air Valve Round Brushed STAINLESS STEEL 125 MM

The valve is closed when the inner disc of the valve actuating element coincides with the zero-plane, Fig. Actuating valve element has only positive travel; it is totally opened when actuating valve element is moved 25 mm from the zero plane. For one turn of the valve actuating element it is longitudinally displaced for 1 mm.

Figure 9 graphically shows the dependence of flow rate, noise intensity and total pressure drop across the valve type **DVSR125**.







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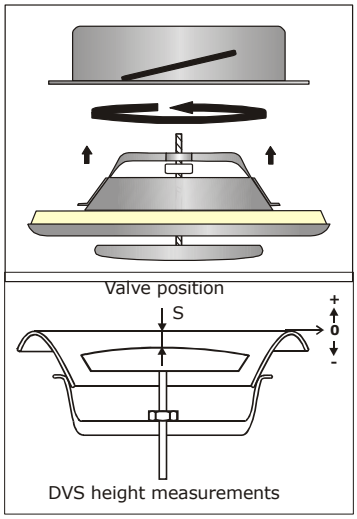
3.051 DVS EXHAUST AIR VALVE

Air Management

TECHNICAL DATA
Powder coated valve *including* fixing collar
DVS is an exhaust valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

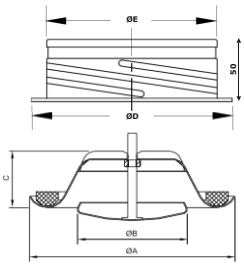
CONSTRUCTION
The **DVS** is manufactured from steel sheet, powder coated. Standard color white (RAL 9010). Other color finishes are available to special order quantities.
The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy regulation and positional locking.
Fixing collar **DVS-F** is manufactured from galvanized steel sheet.

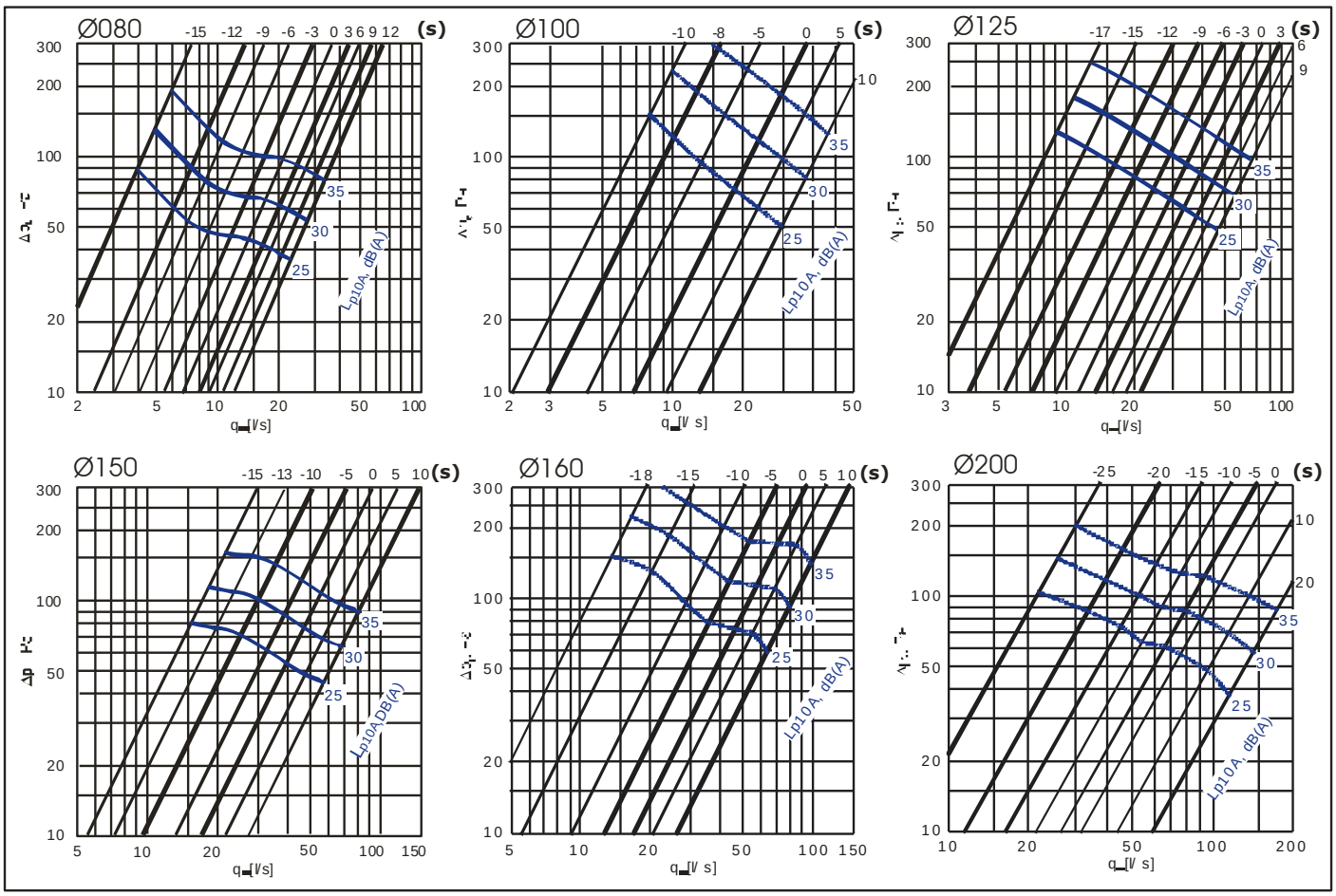
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimension s (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.
Refer to airflow measurement diagrams for information.



DIMENSIONS IN MILLIMETRES

DVS	Ø 080	Ø 100	Ø 125	Ø150	Ø 160	Ø200
A	116	140	170	202	202	254
B	60	75	99	119	119	157
C	40	40	46	54	54	64
Weight	150 gr	160 gr	230 gr	340 gr	340 gr	510 gr
D	105	125	150	175	185	225
E	79	99	124	149	159	199
Weight	80 gr	100 gr	120 gr	180 gr	190 gr	240 gr





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3.051 DVS EXHAUST AIR VALVE

Air Management

SOUND POWER LEVEL L_W

DVS	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
080	1	-2	1	0	-3	-10	-22
100	5	-2	-3	-3	0	-8	-20
125	-6	0	0	-3	0	-13	-25
150	-6	-5	-4	0	-1	-13	-28
160	1	-1	-3	1	-2	-15	-32
200	3	1	-1	1	-4	-12	-25
Tol.+/-	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of **DVS** unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
$\triangle p_{t`}$	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
$\triangle L$	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVS	Adjustment s (mm)	SOUND ATTENUATION ΔL Middle frequency by octave band (Hz)							
		63	125	250	500	1000	2000	4000	8000
080	-9	24	20	14	10	8	5	5	6
	0	24	19	13	9	6	3	4	5
	12	24	19	13	9	5	2	3	4
100	-10	23	19	14	12	11	10	13	14
	0	23	16	11	8	7	6	9	8
	10	23	16	11	7	5	4	7	8
125	-17	20	19	13	10	7	7	11	14
	0	18	16	10	6	4	4	5	8
	9	19	16	9	6	3	3	5	7
150	-15	21	14	11	8	6	6	8	8
	0	20	13	9	6	4	4	7	6
	10	16	14	9	4	3	2	7	7
160	-15	18	13	11	7	6	6	8	8
	-10	18	13	10	6	5	5	7	7
	0	17	13	9	5	4	3	6	6
200	-15	17	12	8	7	6	7	8	9
	-5	17	11	7	6	5	6	6	8
	0	17	11	7	5	5	6	6	7
Tol. ±	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation is obtained in the table above.

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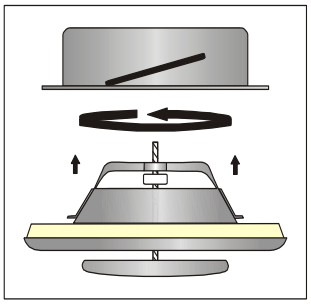
3.052 DVSY EXHAUST AIR VALVE

Air Management

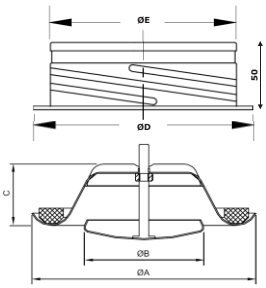
TECHNICAL DATA
Stainless steel valve *including* fixing collar
DVSY is an exhaust valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

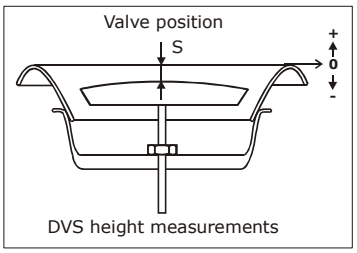
CONSTRUCTION
The **DVSY** is manufactured from stainless steel alloy **AISI304 /2B.**
The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy regulation and positional locking.

Fixing collar **DVS-FY** is manufactured from Stainless steel alloy **AISI304 /2B**



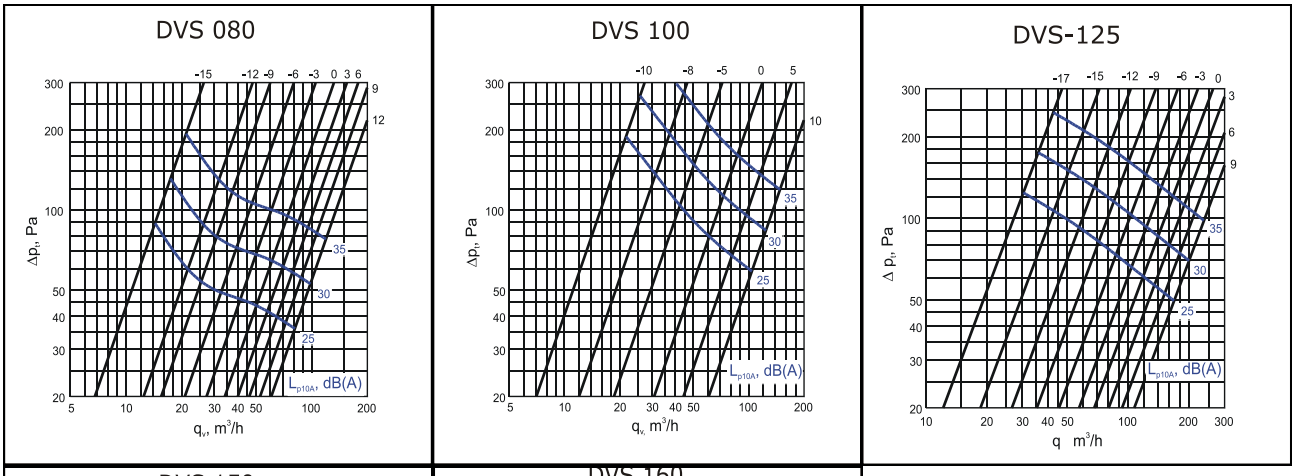
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimensions (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.
Refer to airflow measurement diagrams for information.





DIMENSIONS IN MILLIMETRES

DVSY	Ø 080	Ø 100	Ø 125	Ø150	Ø 160
A	115	138	164	202	211
B	61.5	75	99	119	129
C	42	40	46	50	54
D	105	125	150	175	185
E	79	99	124	149	159
F	77.5	97.5	122.5	147.5	157.5



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3.052 DVSY EXHAUST AIR VALVE

Air Management

SOUND POWER LEVEL L_W

DVSY	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
080	1	-2	1	0	-3	-10	-22
100	5	-2	-3	-3	0	-8	-20
125	-6	0	0	-3	0	-13	-25
150	-6	-5	-4	0	-1	-13	-28
160	1	-1	-3	1	-2	-15	-32
Toler.+/-	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of **DVSY** unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
$\triangle p_t$	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
$\triangle L$	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVSY	Adjust-ment (mm)	SOUND ATTENUATION ΔL Middle frequency by octave band (Hz) 63	125	250	500	1000	2000	4000	8000
080	-9	24	20	14	10	8	5	5	6
	0	24	19	13	9	6	3	4	5
	12	24	19	13	9	5	2	3	4
100	-10	23	19	14	12	11	10	13	14
	0	23	16	11	8	7	6	9	8
	10	23	16	11	7	5	4	7	8
125	-17	20	19	13	10	7	7	11	14
	0	18	16	10	6	4	4	5	8
	9	19	16	9	6	3	3	5	7
150	-15	21	14	11	8	6	6	8	8
	0	20	13	9	6	4	4	7	6
	10	16	14	9	4	3	2	7	7
160	-15	18	13	11	7	6	6	8	8
	-10	18	13	10	6	5	5	7	7
	0	17	13	9	5	4	3	6	6
Tol.	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation is obtained in the table above.

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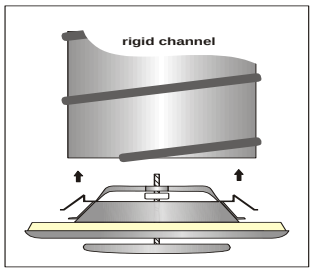
3.053 DVSC EXHAUST AIR VALVE

Air Management

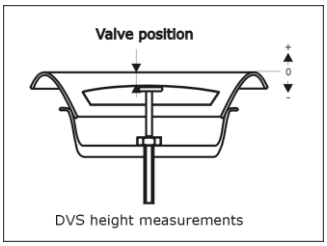
TECHNICAL DATA
Powder coated valve DVSC

DVSC is an exhaust valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure



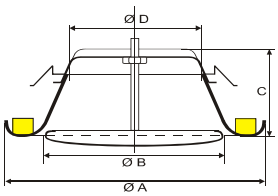
CONSTRUCTION
The **DVSC** is manufactured from steel sheet, powder coated. Standard color white (RAL 9010). Other color finishes are available to special order quantities.
The valve body has a gasket, made of cellular plastic and the control disc, with spring fasteners enables easy regulation and positional locking.

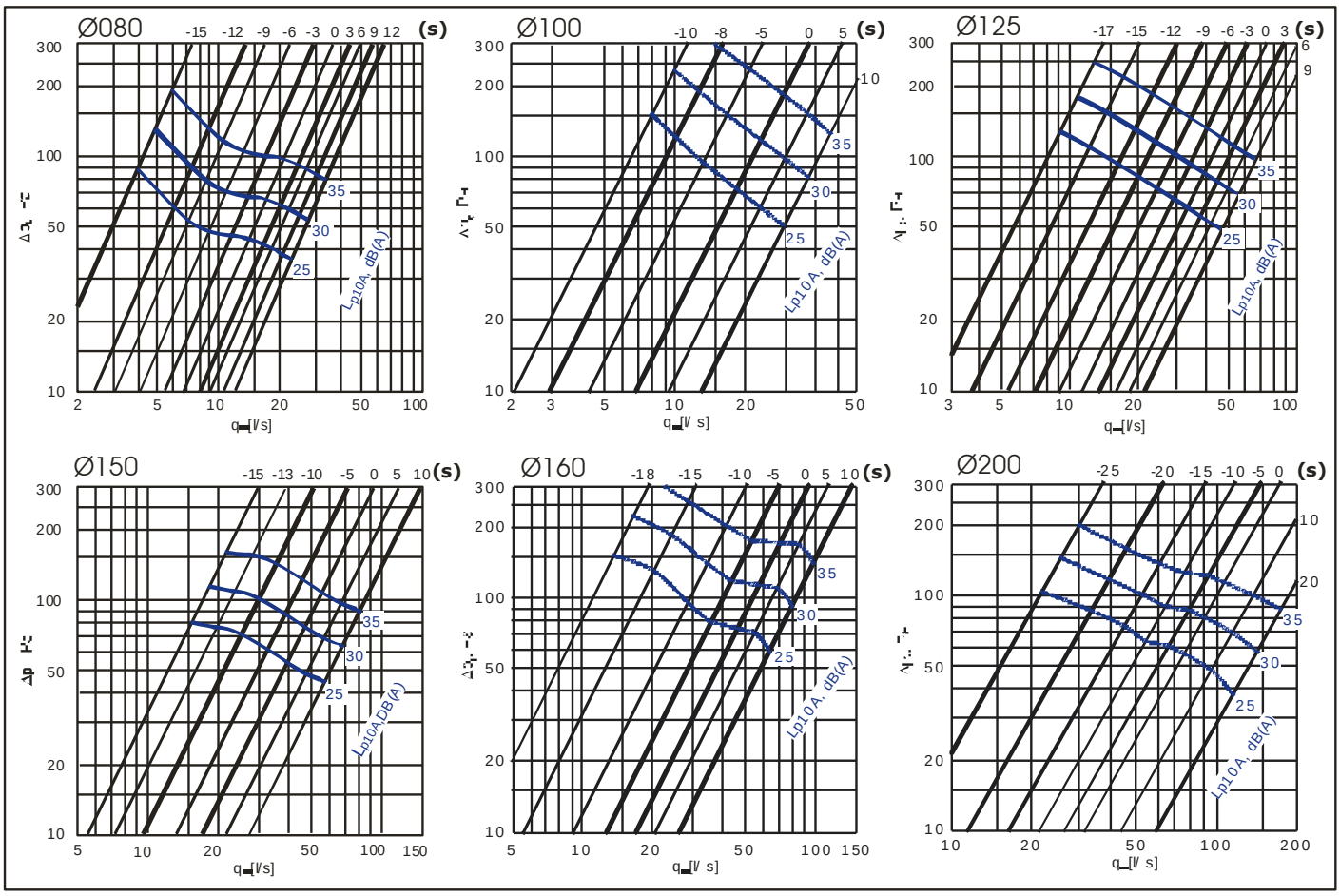
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimensions (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.
Refer to airflow measurement diagrams for information.



DIMENSIONS in mm

DVSC	Ø 080	Ø 100	Ø 125	Ø150	Ø 160	Ø200
A	115	138	164	202	202	248
B	61.5	75	99	119	119	157
C	42	40	46	50	50	63





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3.053 DVSC EXHAUST AIR VALVE
Air Management

SOUND POWER LEVEL L_W

DVSC	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
080	1	-2	1	0	-3	-10	-22
100	5	-2	-3	-3	0	-8	-20
125	-6	0	0	-3	0	-13	-25
150	-6	-5	-4	0	-1	-13	-28
160	1	-1	-3	1	-2	-15	-32
200	3	1	-1	1	-4	-12	-25
Tol.+/-	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of **DVSC** unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
$\triangle p_t$,	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
$\triangle L$	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVSC	Adjust-ment (mm)	SOUND ATTENUATION ΔL Middle frequency by octave band (Hz)							
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
080	-9	24	20	14	10	8	5	5	6
	0	24	19	13	9	6	3	4	5
	12	24	19	13	9	5	2	3	4
100	-10	23	19	14	12	11	10	13	14
	0	23	16	11	8	7	6	9	8
	10	23	16	11	7	5	4	7	8
125	-17	20	19	13	10	7	7	11	14
	0	18	16	10	6	4	4	5	8
	9	19	16	9	6	3	3	5	7
150	-15	21	14	11	8	6	6	8	8
	0	20	13	9	6	4	4	7	6
	10	16	14	9	4	3	2	7	7
160	-15	18	13	11	7	6	6	8	8
	-10	18	13	10	6	5	5	7	7
	0	17	13	9	5	4	3	6	6
200	-15	17	12	8	7	6	7	8	9
	-5	17	11	7	6	5	6	6	8
	0	17	11	7	5	5	6	6	7
Tol.+/-	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation is obtained in the table above.

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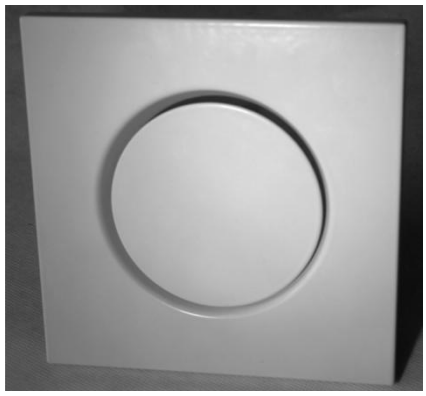
3.054 DVSQ EXHAUST AIR VALVE
Air Management

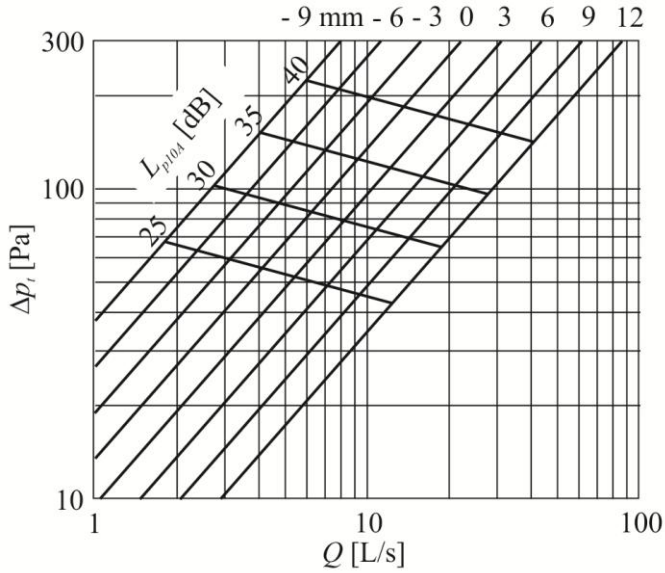
TECHNICAL DATA
Powder coated square valve *including* fixing collar
DVSQ is an exhaust valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

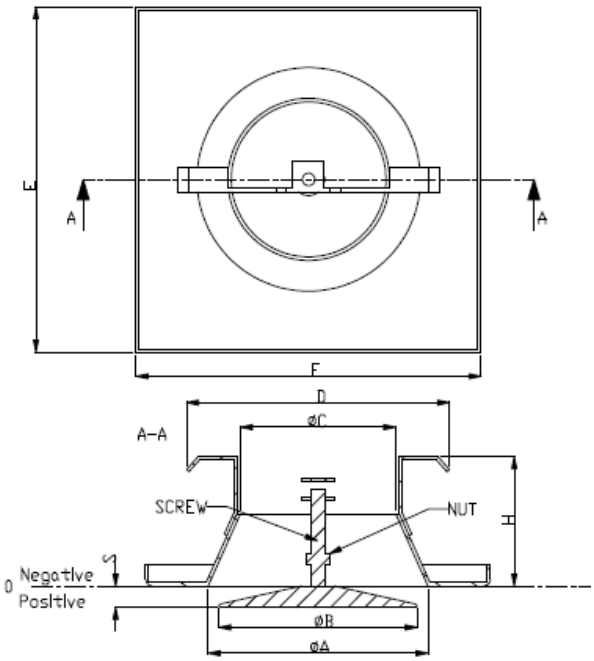


CONSTRUCTION
The **DVSQ** is manufactured from steel sheet, powder coated.
Standard color white (RAL 9010).
Other color finishes are available to special order quantities.
The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy regulation and positional locking.
Fixing collar **DVS-F** is manufactured from galvanized steel sheet.

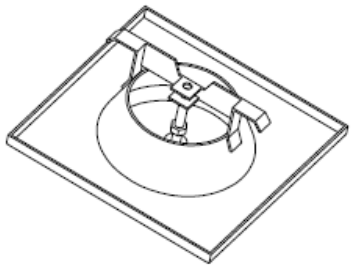
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimension s (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.

The valve is closed when the valve actuating element is placed on -10 mm from the zero-plane, while it is totally opened when the valve actuating element is placed on 7 mm from the zero-plane Fig. For one turn of the valve actuating element it is longitudinally displaced for 1 mm. The graphic shows the dependence of flow rate, noise intensity and total pressure drop across the valve type **DVSQ125**.





øA=103 mm
øB=92 mm
øC=72 mm
D=123 mm
E=160 mm
F=160 mm
H=60 mm
S=+/-



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3.061 DVS-P SUPPLY AIR VALVE

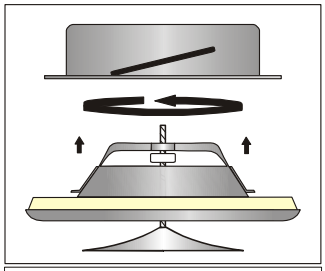
Air Management

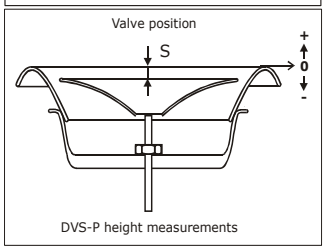
TECHNICAL DATA
Powder coated valve *including* fixing collar

DVS-P is a supply air valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

CONSTRUCTION
The **DVS-P** is manufactured from steel sheet, powder coated. Standard color white (RAL 9010). Other color finishes are available to special order quantity. The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy positional locking.

Fixing collar **DVS-F** is manufactured from galvanized steel sheet.

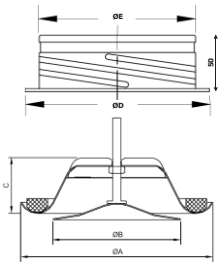


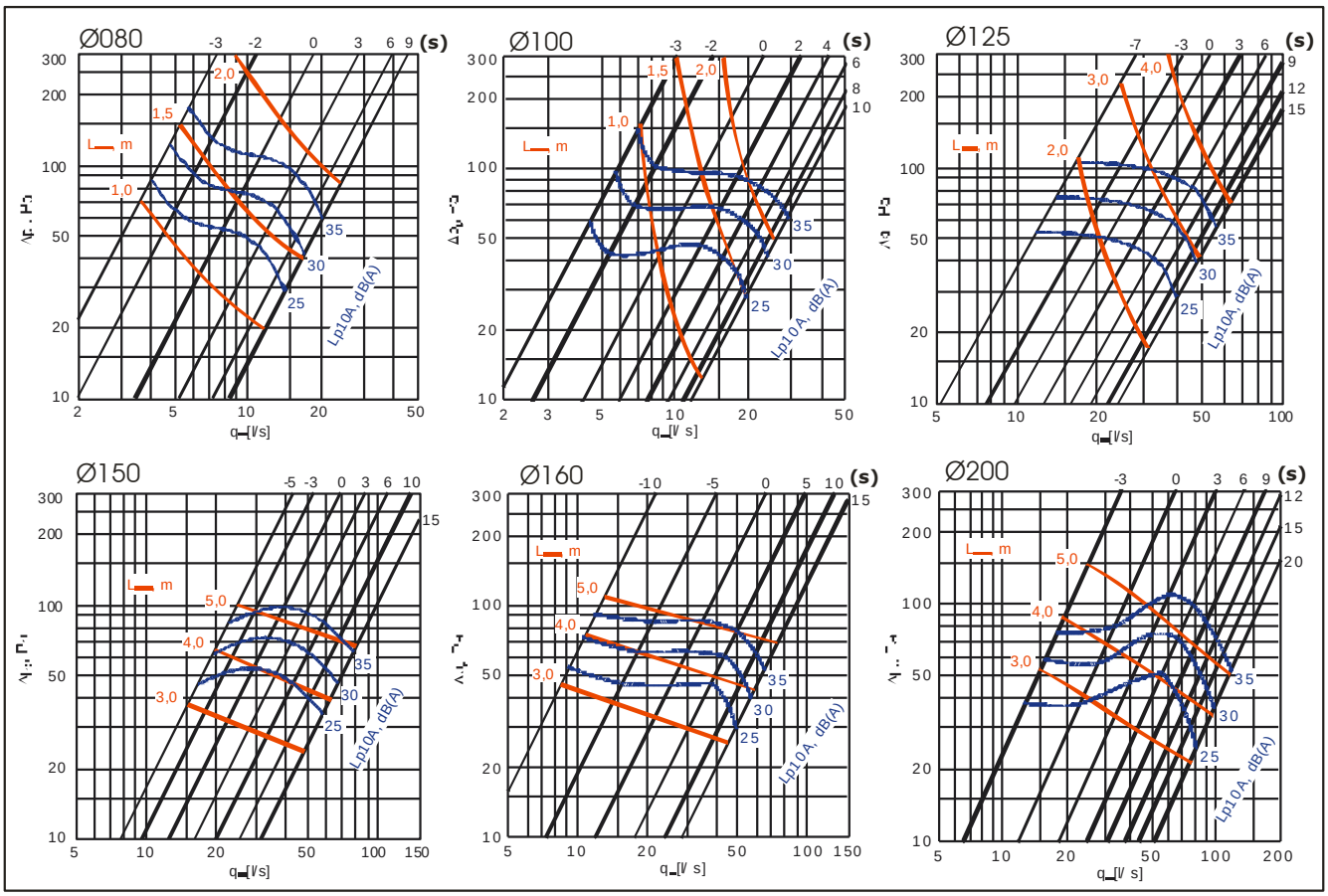


REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimension s (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.
Refer to airflow measurement diagrams for information.

DIMENSIONS IN MILLIMETRES

DVS-P	Ø080	Ø100	Ø125	Ø150	Ø160	Ø200
A	116	140	170	202	202	254
B	76	92	111	135	135	194
C	40	40	46	54	54	64
Weight	150 gr	170 gr	230 gr	340 gr	340 gr	550 gr
D	105	125	150	175	185	225
E	79	99	124	149	159	199
Weight	80 gr	100 gr	120 gr	180 gr	190 gr	240 gr





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3.061 DVS-P SUPPLY AIR VALVE

Air Management

SOUND POWER LEVEL L_W

DVS-P	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
080	2	2	1	0	-3	-9	-17
100	7	3	2	-2	-6	-14	-30
125	3	6	4	-3	-11	-21	-37
150	7	5	3	-2	-10	-20	-34
160	6	7	3	-3	-11	-27	-34
200	7	6	3	-2	-10	-25	-34
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of DVS-P unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
Δp_t	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
ΔL	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVS-P	Adjustment s (mm)	SOUND ATTENUATION ΔL Middle frequency by octave band (Hz)							
		63	125	250	500	1000	2000	4000	8000
080	-3	24	21	16	12	9	7	5	5
	3	24	19	13	10	7	4	4	4
	9	24	19	13	9	6	3	3	4
100	-3	24	19	13	10	9	9	11	9
	6	23	16	11	7	6	5	6	6
	10	23	17	11	7	5	5	5	6
125	-7	19	16	11	7	4	4	5	6
	0	18	16	10	6	4	3	4	6
	15	19	15	9	5	3	2	3	4
150	-5	20	13	10	7	5	4	5	5
	3	19	12	9	5	4	3	4	4
	15	19	12	8	4	3	2	4	3
160	-5	18	13	10	6	5	5	5	6
	5	17	12	9	5	4	3	4	4
	10	17	12	8	5	4	3	4	3
200	3	17	12	8	7	7	5	7	6
	6	17	12	7	6	6	5	7	5
	12	17	11	6	5	5	4	6	5
Tol. ±	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

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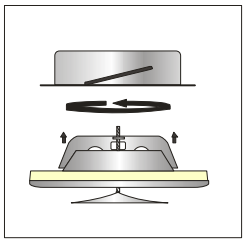
3.062 DVS-PY SUPPLY AIR VALVE

Air Management

TECHNICAL DATA
Stainless steel valve *including* fixing collar

DVS-P is a supply air valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure



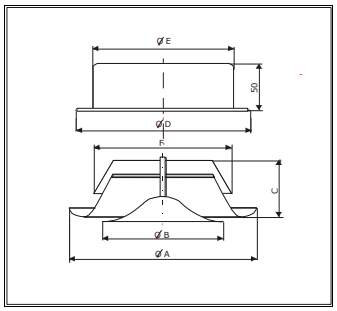
CONSTRUCTION
The **DVS-P** is manufactured from Stainless steel alloy AISI304 /2B.
The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy positional locking.

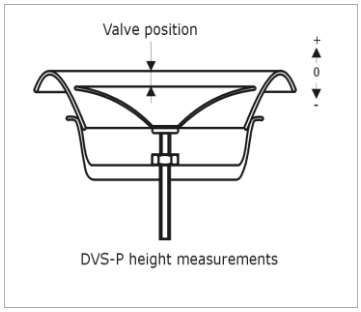
Fixing collar **DVS-FY** is manufactured from Stainless steel alloy AISI304 /2B

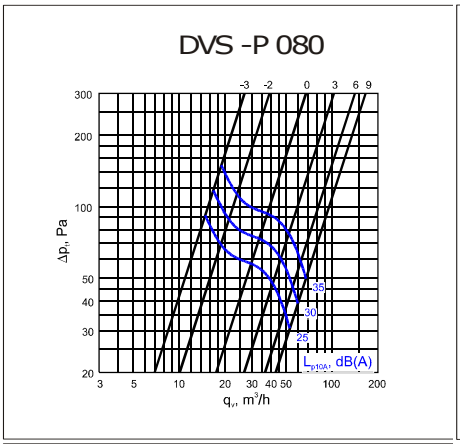
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimensions (mm).
The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.Refer to airflow measurement diagrams for information.

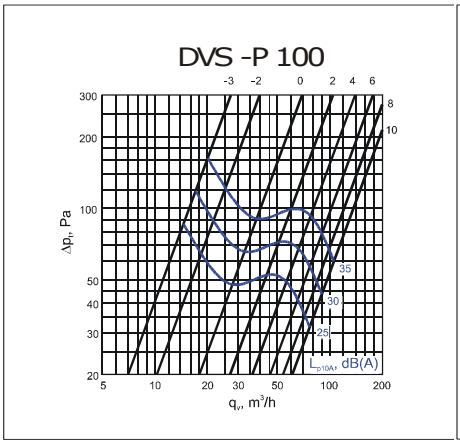
DIMENSIONS IN MILLIMETERS

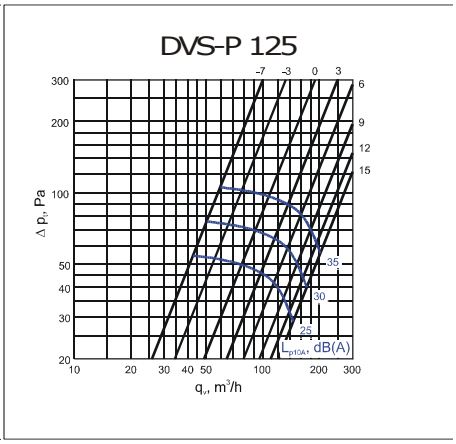
DVS-PY	Ø 80	Ø 100	Ø 125	Ø 150	Ø 160
A	115	138	164	202	211
B	76	92	111	135	147
C	42	40	46	50	54
D	105	125	150	175	185
E	79	99	124	149	159
F	77.5	97.5	122.5	147.5	157.5

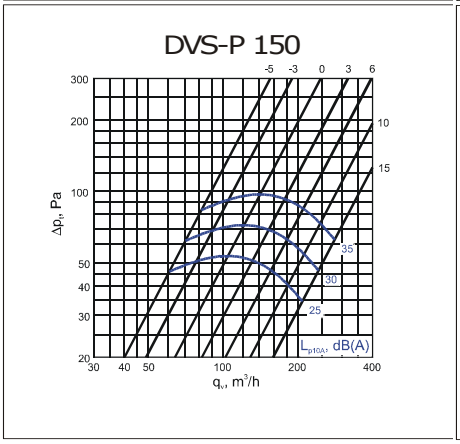


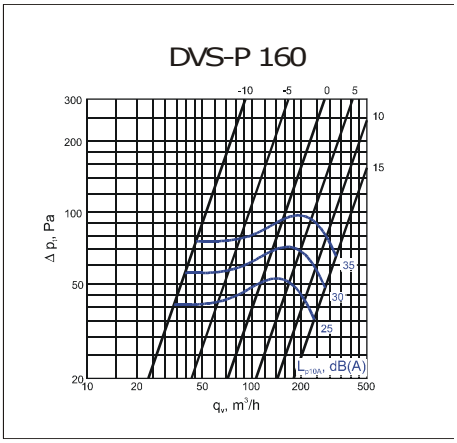












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3.062 DVS-PY SUPPLY AIR VALVE

Air Management

SOUND POWER LEVEL L_W

DVS-PY	CORRECTION K_{oct} (dB)						
	Middle frequency by octave band (Hz)						
	125	**250**	**500**	**1000**	**2000**	**4000**	**8000**
080	2	2	1	0	-3	-9	-17
100	7	3	2	-2	-6	-14	-30
125	3	6	4	-3	-11	-21	-37
150	7	5	3	-2	-10	-20	-34
160	6	7	3	-3	-11	-27	-34
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of DVSC-P unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
Δp_t	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
ΔL	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVS-PY	Adjustment (mm)	SOUND ATTENUATION ΔL (dB)							
		Middle frequency by octave band (Hz)							
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
080	-3	24	21	16	12	9	7	5	5
	3	24	19	13	10	7	4	4	4
	9	24	19	13	9	6	3	3	4
100	-3	24	19	13	10	9	9	11	9
	6	23	16	11	7	6	5	6	6
	10	23	17	11	7	5	5	5	6
125	-7	19	16	11	7	4	4	5	6
	0	18	16	10	6	4	3	4	6
	15	19	15	9	5	3	2	3	4
150	-5	20	13	10	7	5	4	5	5
	3	19	13	9	5	4	3	4	4
	15	19	12	8	4	3	2	4	3
160	-5	18	13	10	6	5	5	5	6
	5	17	12	9	5	4	3	4	4
	10	17	12	8	5	4	3	4	3
Tol.+/-	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

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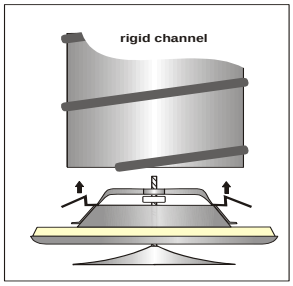
3.063 DVSC-P SUPPLY AIR VALVE

Air Management

TECHNICAL DATA
Powder coated valve DVSC-P

DVSC-P is a supply air valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

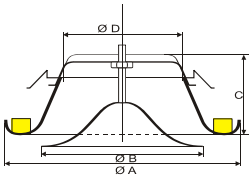
CONSTRUCTION
The **DVSC-P** is manufactured from steel sheet, powder coated. Standard color white (RAL 9010). Other color finishes are available to special order quantity. The valve body has a gasket, made of cellular plastic and the control disc, with spring fasteners enables easy positional locking.

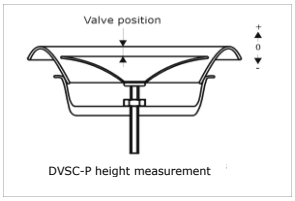


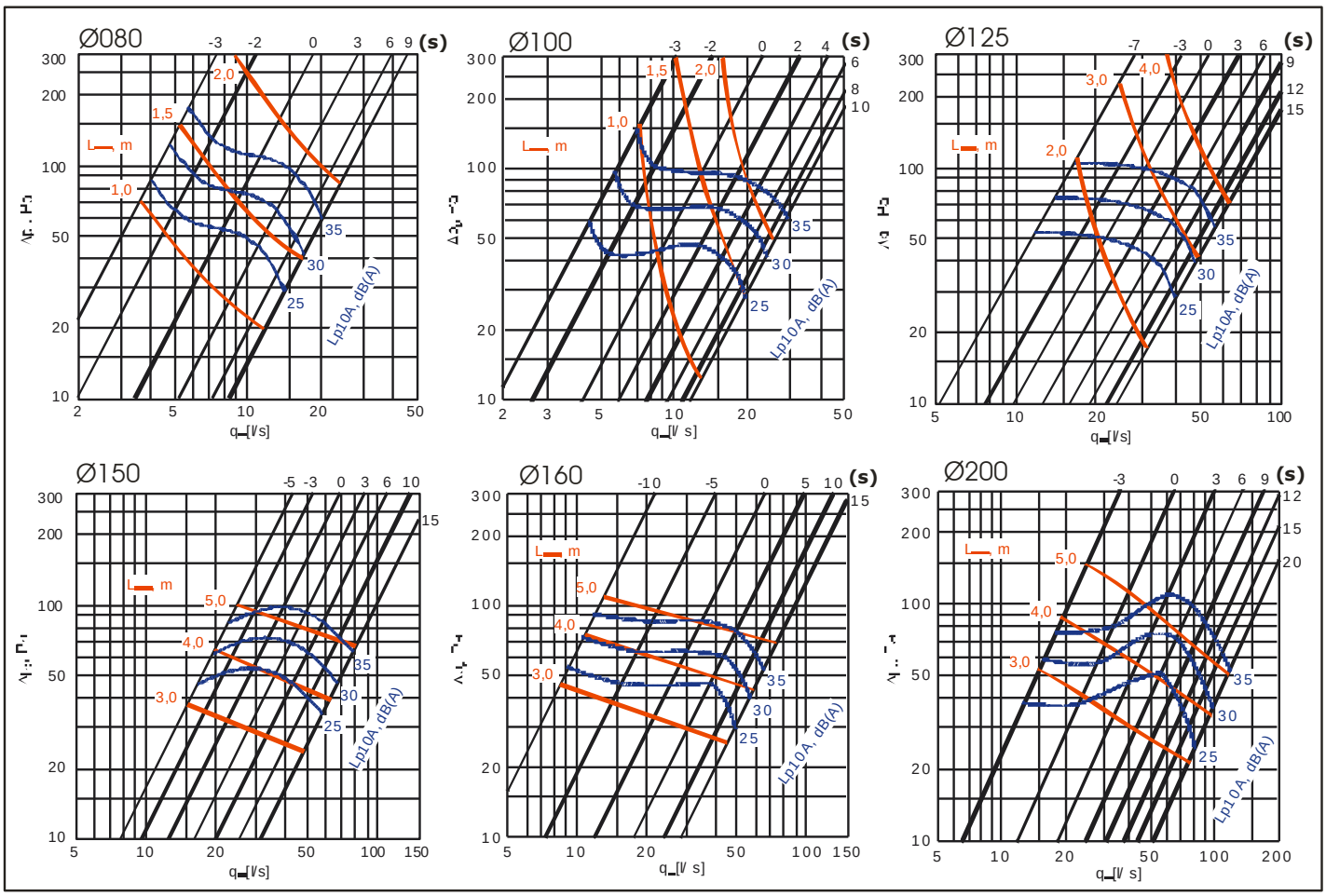
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimensions (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.
Refer to airflow measurement diagrams for information.

DIMENSIONS IN MILLIMETERS

DVSC-P	Ø 80	Ø 100	Ø 125	Ø 150	Ø 160	Ø 200
A	115	138	164	202	202	248
B	76	92	111	135	135	194
C	42	40	46	50	50	63







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3.063 DVSC-P SUPPLY AIR VALVE

Air Management

SOUND POWER LEVEL L_W

DVSC-P	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
080	2	2	1	0	-3	-9	-17
100	7	3	2	-2	-6	-14	-30
125	3	6	4	-3	-11	-21	-37
150	7	5	3	-2	-10	-20	-34
160	6	7	3	-3	-11	-27	-34
200	7	6	3	-2	-10	-25	-34
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of DVSC-P unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
Δp_t	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
ΔL	sound attenuation	(dB)
K_{oct}	correction	(dB)

DVSC-P	Adjustment (mm)	SOUND ATTENUATION ΔL (dB) Middle frequency by octave band (Hz)							
		63	125	250	500	1000	2000	4000	8000
080	-3	24	21	16	12	9	7	5	5
	3	24	19	13	10	7	4	4	4
	9	24	19	13	9	6	3	3	4
100	-3	24	19	13	10	9	9	11	9
	6	23	16	11	7	6	5	6	6
	10	23	17	11	7	5	5	5	6
125	-7	19	16	11	7	4	4	5	6
	0	18	16	10	6	4	3	4	6
	15	19	15	9	5	3	2	3	4
150	-5	20	13	10	7	5	4	5	5
	3	19	13	9	5	4	3	4	4
	15	19	12	8	4	3	2	4	3
160	-5	18	13	10	6	5	5	5	6
	5	17	12	9	5	4	3	4	4
	10	17	12	8	5	4	3	4	3
200	3	17	12	8	7	7	5	7	6
	6	17	12	7	6	6	5	7	5
	12	17	11	6	5	5	4	6	5
Tol.+/-	6	3	2	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

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3.064 DIRC SUPPLY AIR VALVE

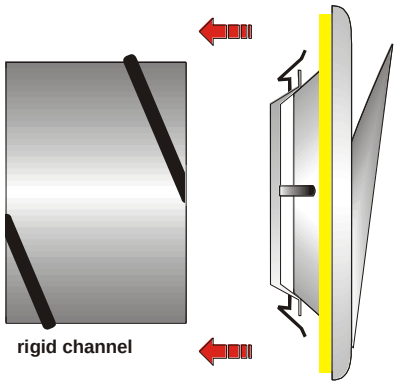
Air Management

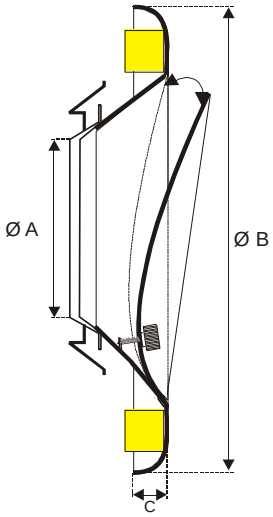
TECHNICAL DATA
METAL SUPPLY VALVE WITH VERTICAL DISCHARGE AND SPRING CONNECTION

PRODUCT PROPERTIES
- diameter range 100 and 125 mm.
- manufactured out of powder coated steel.
- standard colour white (RAL 9010), other colors on request.
- adjustable and lockable disc.
- suitable for direct mounting in round, rigid ducts.
- a longsleeve for mounting in declining ceilings and in walls is optional.

DIMENSIONS (IN MILLIMETRES)

DIR-C	Ø 100	Ø 125
A	88	113
B	145	168
C	18	21





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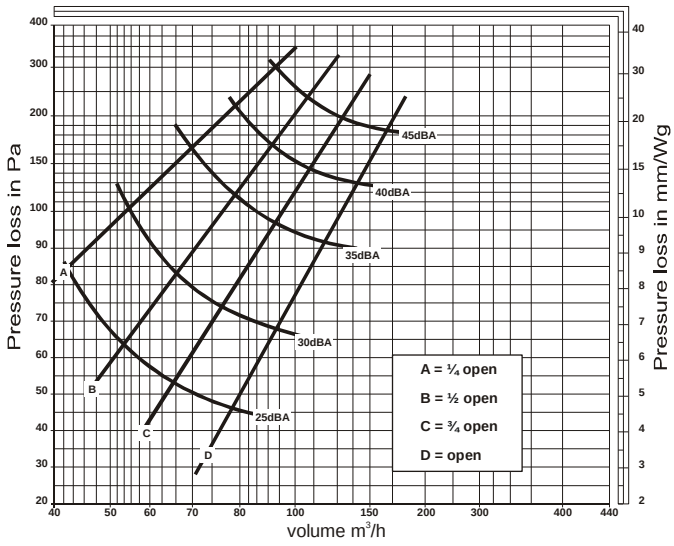

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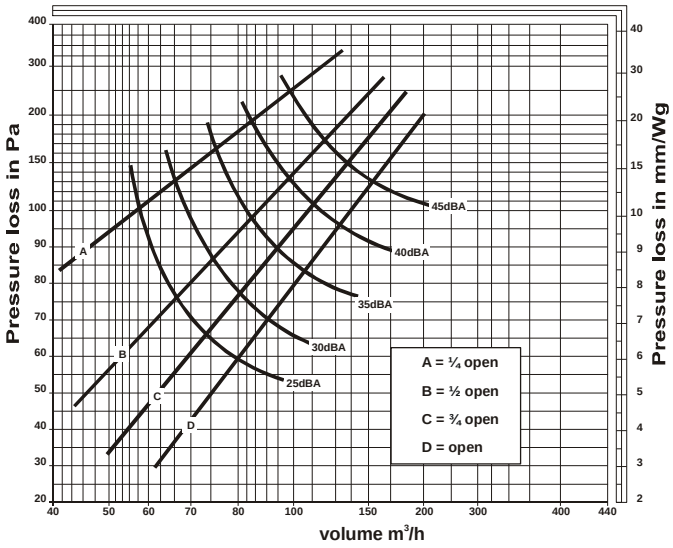

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3.065 DVSQ-P SUPPLY AIR VALVE
Air Management

TECHNICAL DATA
Powder coated square valve *including* fixing collar

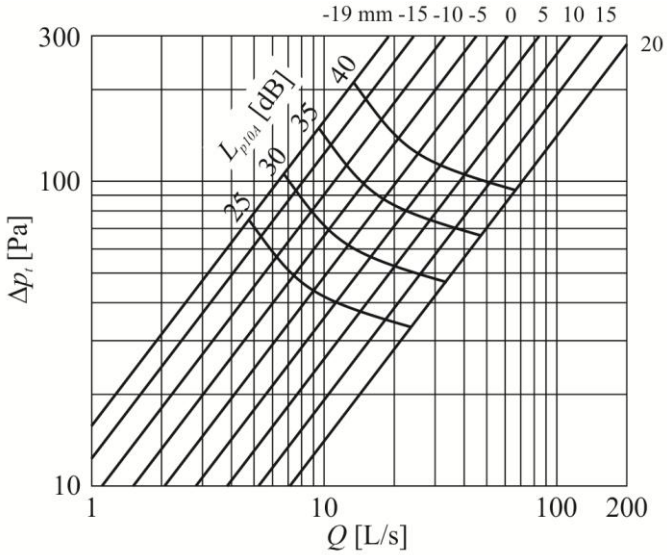
DVSQ-P is a supply air valve suitable for houses, offices etc.
- Good adjusting features
- Low noise level
- Quick and easy to install
- Airflow easy to measure

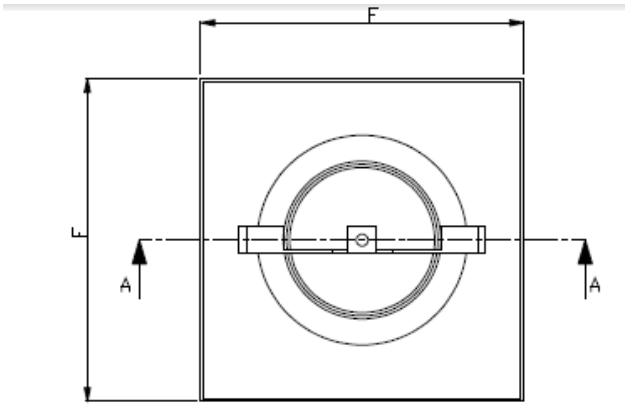
CONSTRUCTION
The **DVSQ-P** is manufactured from steel sheet, powder coated. Standard color white (RAL 9010). Other color finishes are available to special order quantity. The valve body has a gasket, made of cellular plastic and the control disc, with screw spindle, enables easy positional locking.

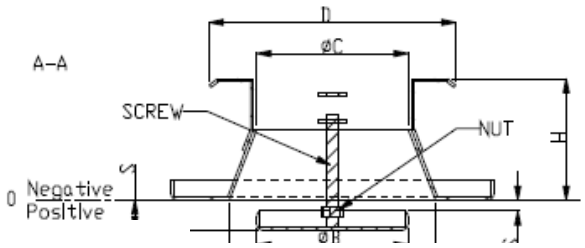
REGULATION AND MEASUREMENTS
Regulation of airflow is achieved by turning the control disc to change adjustment dimension s (mm). The measurement of airflow is made by a pressure difference measurement with a separate measuring tube.

The valve is closed when the valve actuating element is placed on -22 mm from the zero-plane, while it is totally opened when the valve actuating element is placed on 20 mm from the zero-plane.

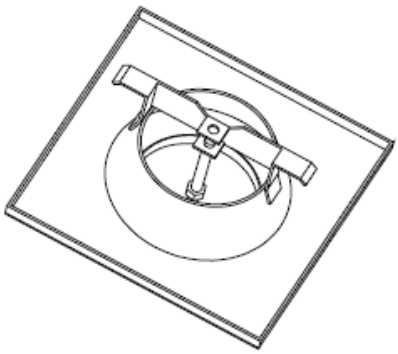
Graphic shows the dependence of flow rate, noise intensity and total pressure drop across the valve type **DVSQ – P125.**







øA=100 mm
øB=77 mm
øC=72 mm
D=120 mm
E=160 mm
F=160 mm
H=58 mm
S=+/-



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3.070 DSO EXHAUST AIR VALVE

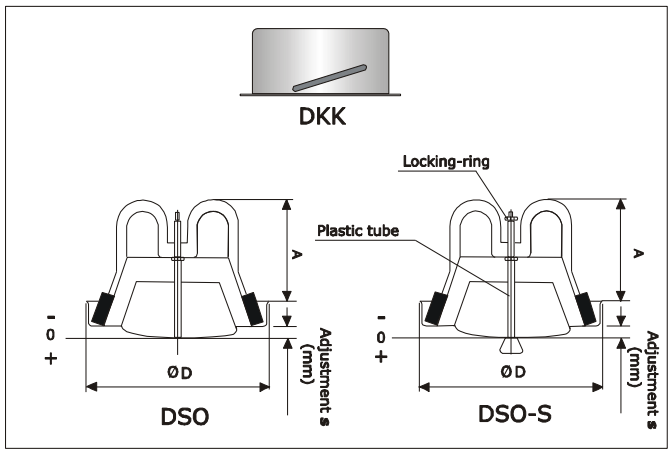
Air Management

TECHNICAL DATA
DSO is an exhaust valve suitable for houses, offices etc.
DSO-S is designed for sauna rooms.
- Good adjusting features
- Low noise level
- Good sound attenuation features
- Quick and easy to install
- Easy to measure the air flow

CONSTRUCTION
The **DSO** exhaust valve is made of steel sheet.
Standard color is white (RAL9010). Other colors are available to special order. The body is equipped with cellular plastic gasket to form an airtight seal. Adjustment of the airflow is simple, the inner cone being rotated to the required setting and locked in the position with a single nut. For mounting a mounting-ring **DKK** can be ordered.

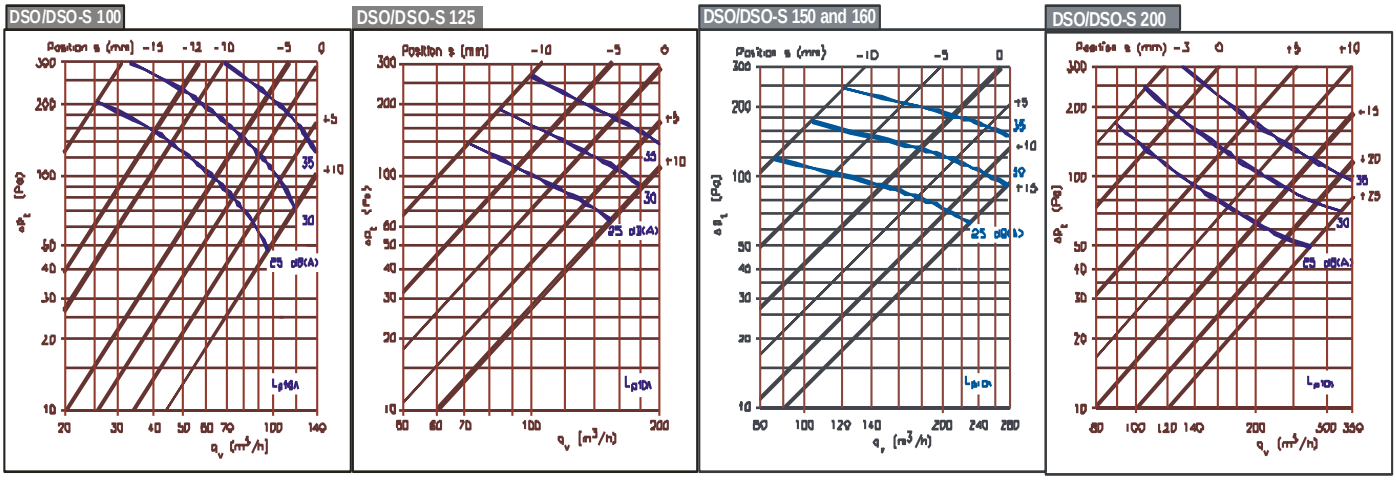
Sauna valve **DSO-S** can be opened and closed simply by pushing or pulling the wooden knob. Max. opening is adjusted by moving the retaining ring. Min. opening, which is pre-adjusted into pos. 0 mm, can be adjusted by shortening the plastic tube. Max. working temperature +120°C.
For mounting a mounting-ring **DKK** can be ordered.

REGULATION AND MEASUREMENTS
The measurement of airflow is made as a pressure difference measurement with a separate measuring tube. Regulation of air volume is made by changing the position **s**. For diagrams for measuring and regulation see the separate diagram. Refer to airflow measurement diagrams for information.



DIMENSIONS IN MILLIMETRES

DSO	Ø D	A	Weight g
100	134	74	300
125	160	85	390
150/160	191	89	570
200	241	107	760
DSO-S	**Ø D**	**A**	**Weight g**
100	*134*	*73*	310



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3.070 DSO EXHAUST AIR VALVE
Air Management

SOUND POWER LEVEL L_W

DSO/DSO-S	CORRECTION K_{oct} (dB)						
	Middle frequency by octave band (Hz)						
	125	**250**	**500**	**1000**	**2000**	**4000**	**8000**
100	-2	1	1	0	-5	-9	-23
125	-3	-2	-1	-4	0	-8	-24
150/160	1	-3	-1	2	-8	-12	-25
200	-1	-3	-4	2	-5	-9	-26
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of DSO unit.

DEFINITIONS		
q_v	air volume	(m^3/h)
$\square p_t$	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
$\square L$	sound attenuation	(dB)
K_{oct}	correction	(dB)

SOUND ATTENUATION)L

DSO/DSO-S	SOUND ATTENUATION)L							
	Middle frequency octave band(Hz)							
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
100	23	18	14	12	12	14	5	6
125	21	17	12	11	12	11	7	6
150/160	19	14	12	11	11	14	5	7
200	15	13	11	11	13	12	7	7
Toler.+/-	6	3	2	2	2	2	2	3

The average sound attenuation ☐Lfrom duct to room, including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

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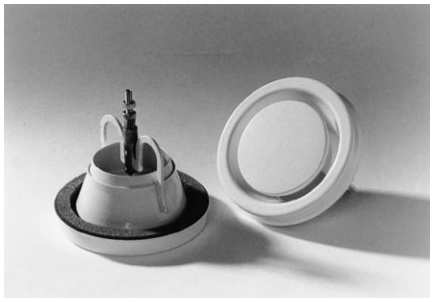
3.080 DSO-P EXHAUST AIR VALVE

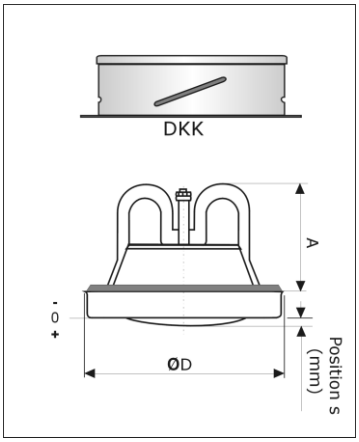
Air Management



TECHNICAL DATA

DSO-P is developed for use as a fire damper in exhaust ventilation systems. **DSO-P** has been fire resistance tested using the general principles of BS476: part 20:1987.
DSO-P fire damper valve operated satisfactorily and retained its integrity for 135 min test duration.

- Vertical and horizontal ducting
- Access hole is not needed
- The springloaded fuse can be changed
- Melting point at +70 °C
- Quick and easy to install
- Good sound attenuation features
- Low noise level



The **DSO-P** fire damper is manufactured from steel sheet painted white, other color finishes are available to special order.
Valve body has a gasket made of cellular plastic and the control disc with screw spindle enables easy regulation and positional locking. The control disc will close when temperature in the immediate vicinity reaches the fusible link rating. The standard fusible link is rated at +70° C. Other release temperatures are available to special order. The unit is supplied with mounting ring **DKK** manufactured from galvanized steel sheet.

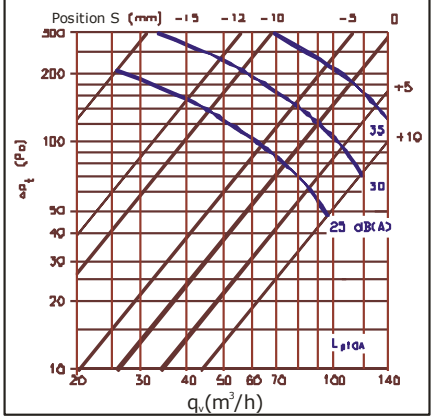
REGULATION AND MEASUREMENTS

Regulation of airflow is achieved by turning the control disc to change adjustment dimension **s** (mm). Measuring data sheets are supplied with the valves.

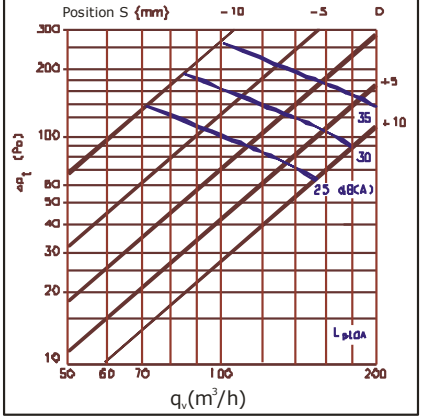
DIMENSIONS IN MILLIMETRES

DSO-P	Ø D	A	Weight g
100	134	74	305
125	160	85	390
150/160	191	89	575
200	241	107	765

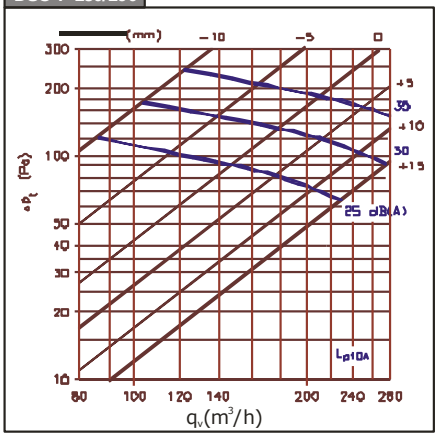
DSO-P 100



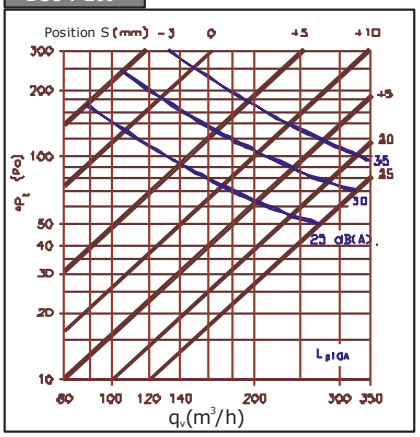
DSO-P 125



DSO-P 150/160



DSO-P 200



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3.080 DSO-P EXHAUST AIR VALVE
Air Management

SOUND POWER LEVEL L_W

DSO-P	CORRECTION K_{oct} (dB)						
	Middle frequency by octave band (Hz)						
	125	**250**	**500**	**1000**	**2000**	**4000**	**8000**
100	-2	1	-1	1	-4	-8	-22
125	-3	-3	-3	-2	0	-7	-24
150/160	0	-3	-1	2	-7	-11	-25
200	1	-3	-4	3	-8	-12	-29
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in frequency range (Hz).

DEFINITIONS		
q_v	air volume	(m^3/h)
Δp_t	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m^2sab)	[dB(A)]
L_{Woct}	sound power level by octave bands	(dB)
ΔL	sound attenuation	(dB)
K_{oct}	correction	(dB)

SOUND ATTENUATION ΔL

DSO-P	Adjustment (mm)	SOUND POWER LEVEL ΔL							
		Middle frequency octave band(Hz)							
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
100	-10	22	19	16	16	16	18	9	9
	0	22	18	13	12	12	13	6	7
	+10	22	17	12	9	8	11	4	6
125	-10	21	18	15	14	15	14	10	7
	0	19	17	12	11	11	10	6	5
	+10	20	16	10	9	9	8	5	5
150/160	-10	19	16	14	14	14	16	8	8
	0	18	14	11	11	11	13	5	7
	+10	18	14	10	9	9	11	4	6
200	-10	15	15	14	14	16	15	10	9
	0	14	12	11	10	12	12	7	7
	+10	13	11	8	8	9	10	6	6
Tol.±		6	3	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room, including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

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3.090 DTI SUPPLY AIR VALVE

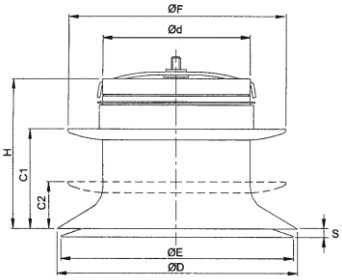
Air Management

TECHNICAL DATA
Metal Supply air valve with stepless flowdirection adjustment

MECHANICAL PROPERTIES
- Diameters 100, 125, 160 and 200 mm.
- Manufactured from reliable and robust white steel sheet (RAL 9010).
- High valve body improving air flow/less noise.
- Can be quickly installed directly into the duct without a mounting frame.
- No leakage between valve body and connection bush.
- Variable volume flow control with locking button.
- Flow direction can be set steplessly.
- Adjustable diffusion pattern with sector plates.
- Suitable for houses, offices etc.

DIMENSIONS in mm

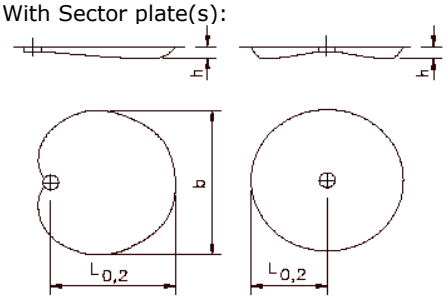
DTI	d	D	H	C1	C2	E	F
100	95	155	95	60	25	150	141
125	120	185	95	60	25	180	166
160	155	226	100	63	28	220	201
200	195	274	100	63	28	268	241



Diffusion Pattern:

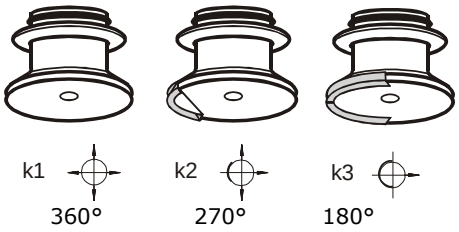
DTI DTI

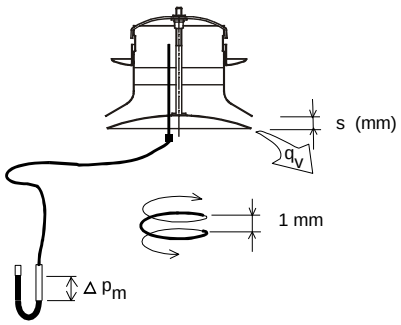
With Sector plate(s):



Adjustment	ΔT (°C)	b (m)	$L_{0.2(\Delta t)}$(m)	h (mm)	
	0 -8	- -	1 0.7 x $L_{0.2}$	9 x s + 75 11 x s + 80	S = adjustment position (mm)
	0 -8	2 x $L_{0.2}$ 2 x $L_{0.2}$	1 0.9 x $L_{0.2}$	9 x s + 75 11 x s + 80	
	0 -8	0.5 x $L_{0.2}$ 0.5 x $L_{0.2}$	1 0.9 x $L_{0.2}$	9 x s + 75 11 x s + 80	

Air Management





$$q_v = k\sqrt{\Delta p_m}$$

(l/s) (Pa)

DTI - 100				DTI - 125				DTI - 160				DTI - 200			
S	k1	k2	k3	S	k1	k2	k3	S	k1	k2	k3	S	k1	k2	k3
2	1.0	1.1	0.8	2	0.7	1.0	0.8	2	1.6	-	-	2	2.9	2.5	1.8
3	1.6	1.5	1.1	3	1.1	1.6	1.1	3	2.4	2.3	1.6	3	3.8	3.0	2.7
4	2.0	1.8	1.4	4	2.0	1.9	1.5	4	3.2	2.7	2.1	4	5.7	4.4	3.6
6	3.0	2.5	1.7	6	3.4	2.8	2.1	6	4.7	3.8	2.9	6	7.4	5.7	4.5
8	3.8	3.2	2.2	8	4.8	3.8	2.7	8	6.3	5.0	3.6	8	9.3	7.1	5.4
10	4.8	3.9	2.6	10	6.0	4.7	3.3	10	7.7	6.1	4.4	10	11.0	8.3	6.4
12	5.6	4.2	3.0	12	7.1	5.5	3.8	12	9.1	7.1	4.9	12	14.6	11.0	8.0
16	-	-	3.6	16	9.0	7.0	5.0	16	11.8	9.2	6.5	16	17.9	13.5	9.8
								20	14.3	11.2	7.8	20	21.9	16.2	11.7

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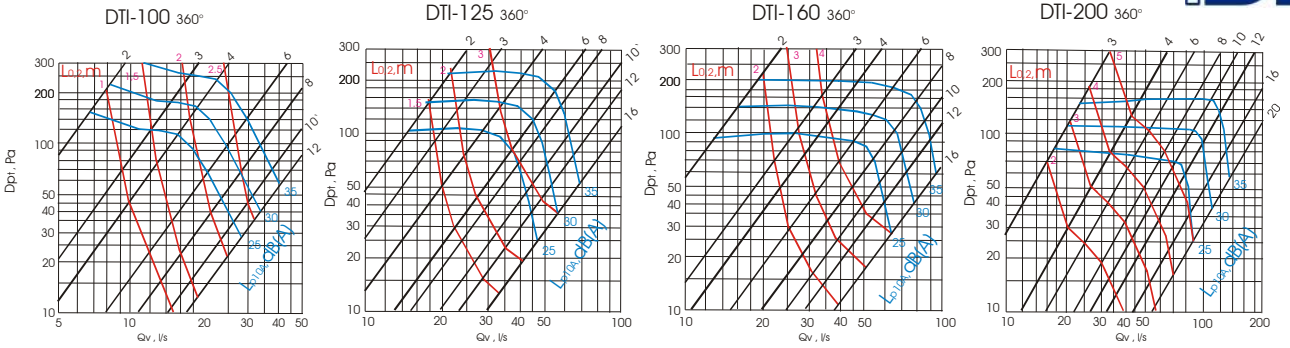
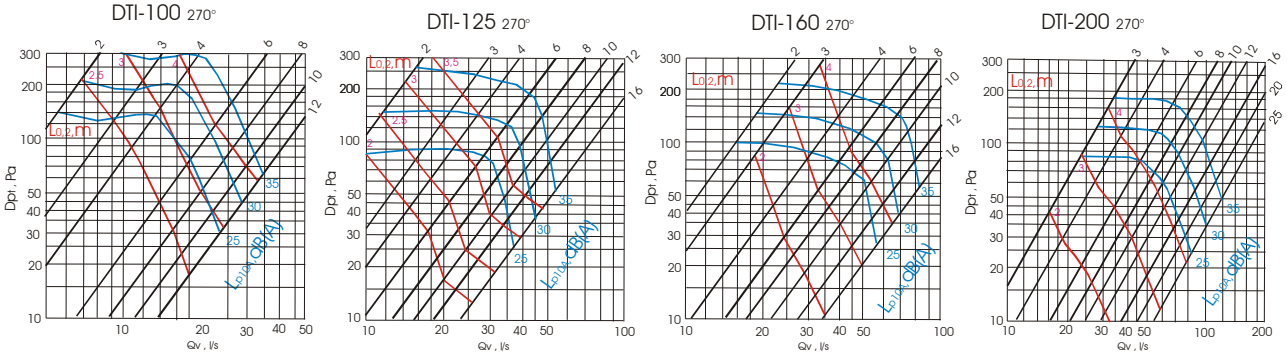
3.090 DTI SUPPLY AIR VALVE

Air Management

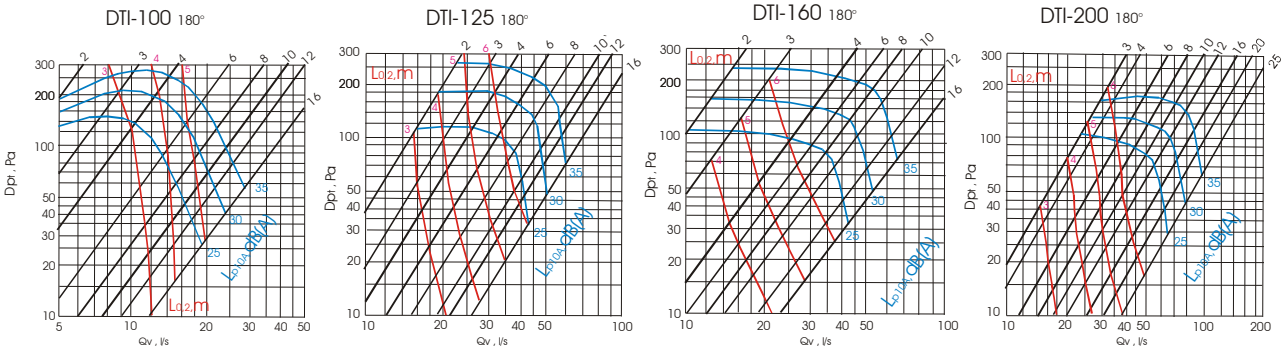
K1



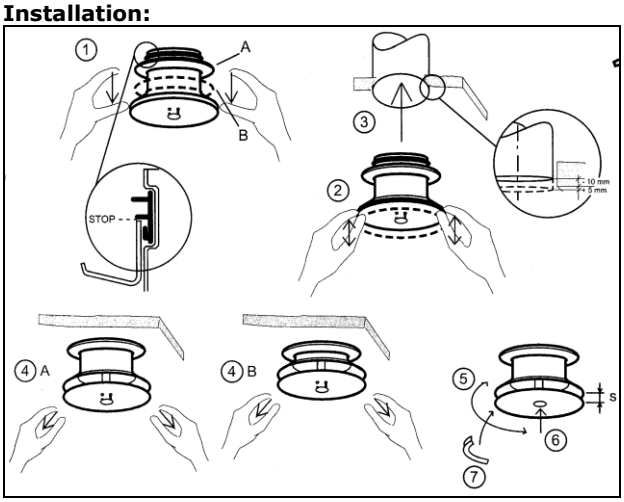
K2



K3



Installation:



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3.100 DTVK SUPPLY AIR VALVE

Air Management

TECHNICAL DATA

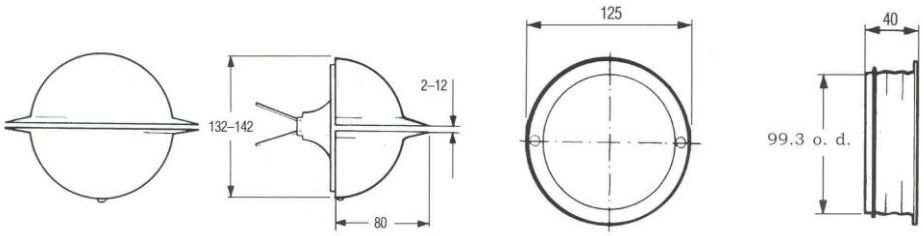
The **DTVK** is a very quiet supply air valve designed for wall mounting.
The valve is suitable for use in small premises, such as offices, houses and hotel rooms.The air discharged from the valve is mixed thoroughly with room air thus providing a draught-free air supply. The air flow is adjustable. The design of the **DTVK** minimizes the risk of dust deposits forming on the wall surface. The valve is easy to install and easy to keep clean since it has large, smooth surfaces. The **DTVK** is made of hot galvanized sheet steel and stove enamelled in white (RAL9010).

DTVK	SOUND ATTENUATION ΔL							
	Middle frequency by octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
100	24	20	18	12	10	10	10	10
Tol.+/-	6	3	2	2	2	2	2	3

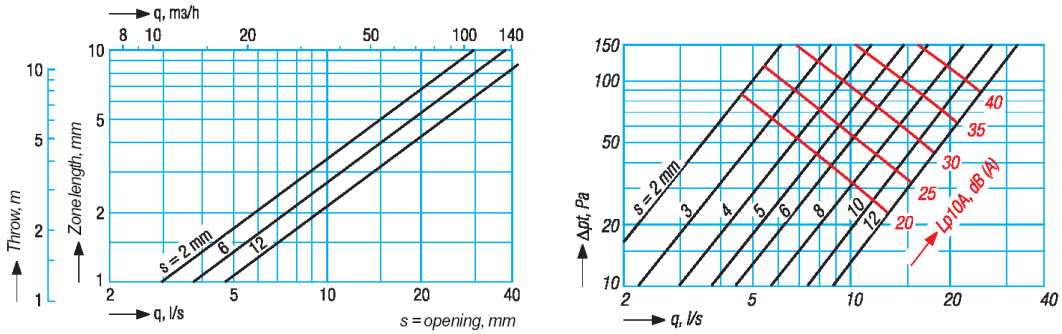
The average sound attenation **ΔL** from duct to room including the end reflection of the connecting duct in wall installation, is obtained in the table above.

Dimensions and weight

Supply air valve **DTVK-100** (weight 0.4kg) Mounting ring **DGEZ-10** (weight 0.1kg)



Air flow, zone length, throw, pressuredrop



Air stream diffusion Bv = 0.1 x $L_{0.2}$ Bh = 0.6 x $L_{0.2}$ Where $L_{0.2}$ = 1.2 x zone length

SOUND POWER LEVEL L_W

DTVK	CORECTION K_{oct}							
	Middle frequency by octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
100	2	-3	-3	0	0	-3	-6	-10
Tol.+/-	6	3	2	2	2	2	2	3

Correction K_{oct} is average value in range of use of **DTVK** unit.

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A) the corrections K_{oct} presented in the table according to the following formula:
$L_{Woct} = L_{p1-A} + K_{oct}$

ADJUSTMENT

DTVK-100	S,mm	2	3	4	5	6	8	10	12
	k	0.48	0.71	0.94	1.2	1.4	1.8	2.2	2.7

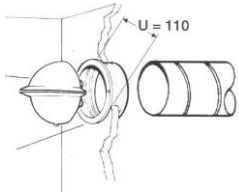
$q = k\sqrt{\Delta pm}$ (l/s) (Pa)

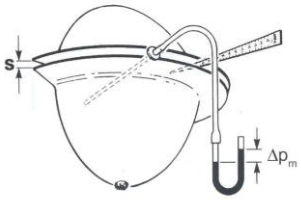
$q = 3.6k\sqrt{\Delta p_m}$ (m^3/h) (Pa)

Definitions:

q	air volume	(l/s),(m^3/h)
Δp_t	total pressure drop	(Pa)
L_{p10A}	sound pressure level with 4dB Room attenuation (10m^2sab)	[dB(A)]
L_{Woct}	sound power level	(dB)
ΔL	sound attenuation	(dB)
K_{oct}	correction	(dB)
$L_{0.2}$	throw corresponding 0.2m/s Final velocity	(m)

INSTALLATION.
DTVK connected to a mounting ring





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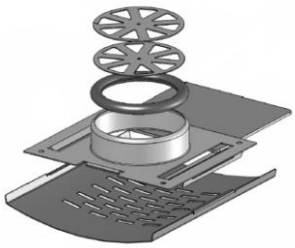
3.110 DLD SUPPLY/EXHAUST AIR VALVE

Air Management

Controlled Homeventilation

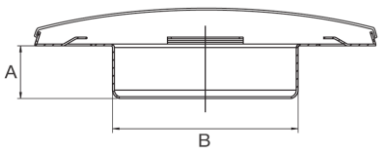


TECHNICAL DATA

Design air valve for use as supply or exhaust air valve in ventilation systems. Valvebody and removable screen are manufactured out white powder-coated steel sheet. Available in four sizes for the connection to ventilation ducts nominal size 100, 125, 160 or 200 mm. All sizes are equipped with connection sleeves and integrated, steplessly adjustable throttle screen for flow rate adjustment. For the reduction of dirt entry in/from the ducting system all air valves are supplied with a removable washable aluminium filter.

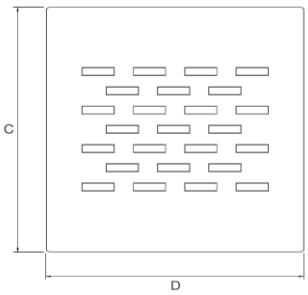
PRODUCT PROPERTIES

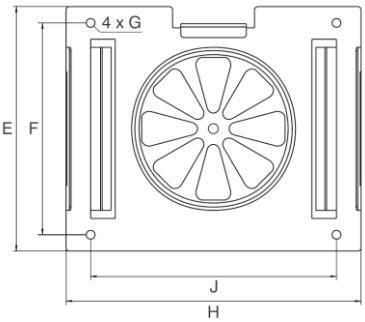
- Nominal size 100, 125, 160 and 200 mm
- White powder-coated steel sheet (RAL 9010)
- Also available in stainless steel
- Removable screen
- Integrated variable adjustable throttle
- Connection for direct assembly with flexible ducts
- Washable aluminum expanded metal filter

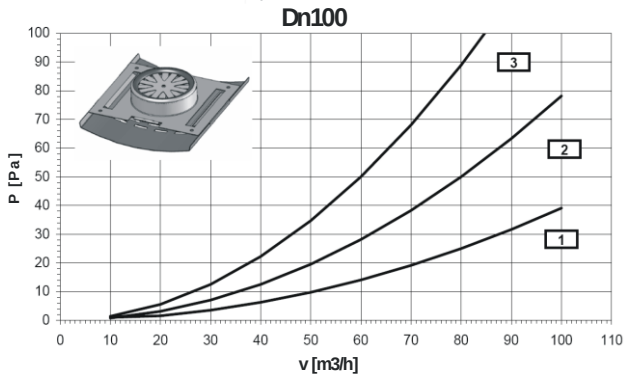


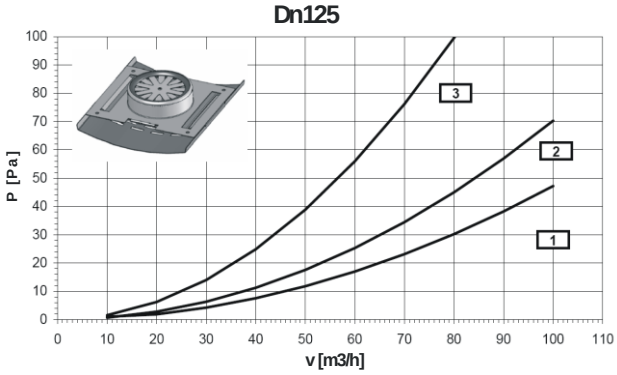
alpha

DLD-P	Ø100	Ø 125	Ø 160	Ø 200
A	30	30	30	30
B	98	123	158	198
C	210	210	270	320
D	182	207	242	282
E	150	175	210	250
F	130	155	190	230
G	5.5	5.5	5.5	5.5
H	180	205	240	280
J	150	175	210	250

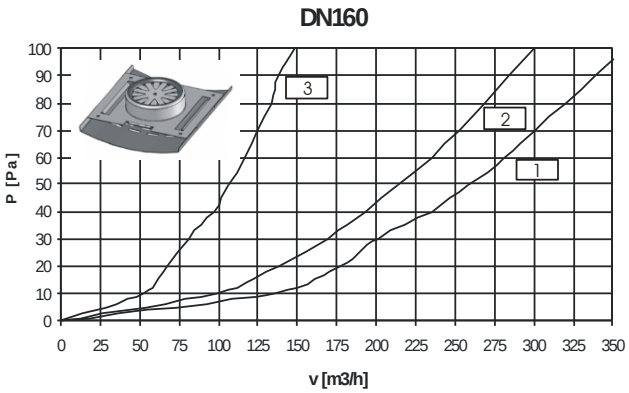


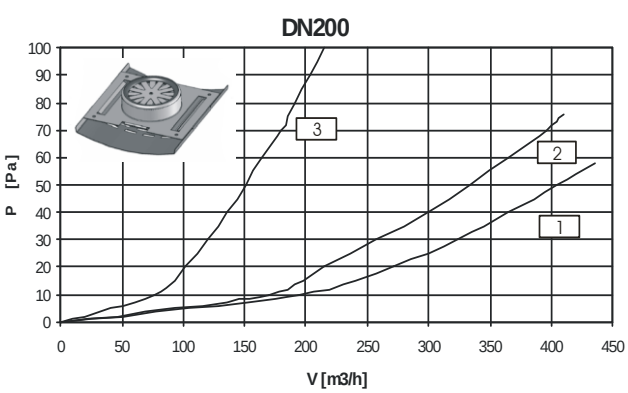






1 without filter & fully opened, 2 with clean filter & fully opened, 3 with clean filter, 50 % opened





1 without filter & fully opened, 2 with clean filter & fully opened, 3 with clean filter, 50 % opened
Measurement: Filter in the pure/clean condition !

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3.120 IRIS DAMPER Air Management

TECHNICAL DATA
IRIS REGULATION AND MEASURING DEVICE

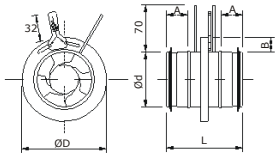
The ideal solution for the exact and quick air flow measuring and regulation.
- Low noise level
- Operation independent of flow direction
- Fully openable for cleaning of duct tight construction
- Solid construction

CONSTRUCTION
The **IRIS DAMPER** is composed of regulation plates, regulating nut or handle (size 80) and regulation scale plus manometer connections and casing. The casing and regulation plates are made of hot-galvanized steel, other components of plastic. The joining collars are supplied with rubber sealing gasket.

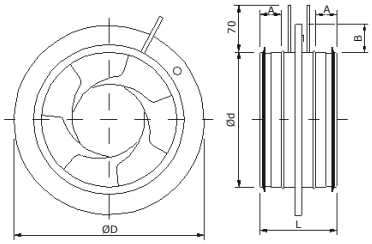
INSTALLATION
The **IRIS DAMPER** is secured to the ducting with rivets. For vertical mounting, ensure the weight of the interconnecting ductwork is fully supported. Refer to the table for recommended safety distances.

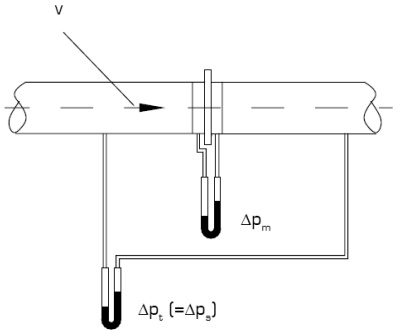
REGULATION AND MEASUREMENT OF AIR FLOW
The regulation plates form a virtually ideal measuring orifice which enables an easy and reliable measurement of the air flow. To determine the airflow, measure the pressure difference Δp_m at the manometer connections and check the corresponding airflow from the regulation chart. **The chart is shown on the damper casing and in the separate information for air flow regulation and measurement** (**the selection diagrams do not serve the air flow measurement).** The adjustment of the Iris is simple, all that is needed is a standard 13mm spanner and the damper locks in the right position automatically.

Size Ø80 mm



Size Ø100 mm - Ø800 mm





DIMENSIONS IRIS

Size	Ød	ØD	L	A	B	Weight kg
80	79	125	120	35	22	0.5
100	99	165	110	30	32	0.5
125	124	188	110	30	32	0.7
150	149	230	110	30	40	0.9
160	159	230	110	30	35	0.9
200	199	285	110	30	42	1.4
250	249	335	132	40	42	2.1
315	314	410	132	40	47	3.5
400	398	525	155	50	62	6.4

SPECIAL SIZES IRIS

Size	Ød	ØD	L	A	B	Weight kg
180	179	285	255	37	53	1.9
300	299	410	135	37	54	3.5
355	353	525	410	60	85	9.8
500	498	655	155	50	77	9.6
630	628	815	155	50	92	15.6
800	798	1015	270	100	107	25.0

DIMENSIONS IRIS-S (Stainless steel)

Size	Ød	ØD	L	A	B	Weight kg
100	99	165	115	32	32	0.5
125	124	188	115	32	32	0.7
150	149	230	115	32	40	0.9
160	159	230	115	32	35	0.9
200	199	285	120	32	42	1.4
250	249	335	145	45	42	2.1
315	314	410	145	40	47	3.5
400	398	525	190	60	62	6.4

SPECIAL SIZES IRIS-S (Stainless steel)

Size	Ød	ØD	L	A	B	Weight kg
300	299	410	150	45	54	3.5
500	498	655	175	60	77	9.6
800	798	1015	285	100	107	25.0

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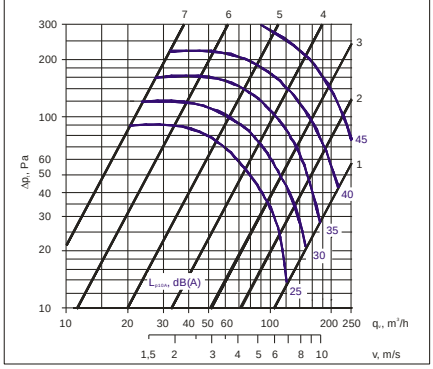
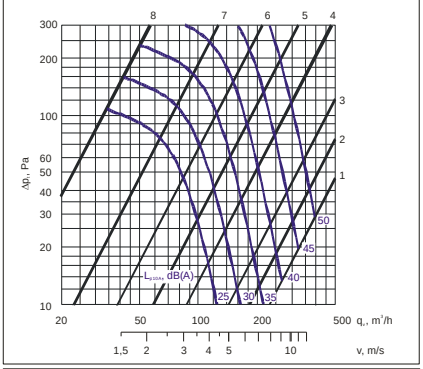
3.120 IRIS DAMPER Air Management

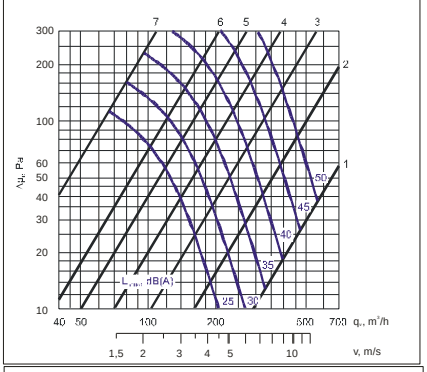
IRIS-080



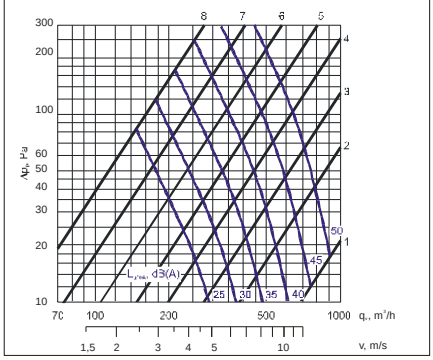
IRIS-100



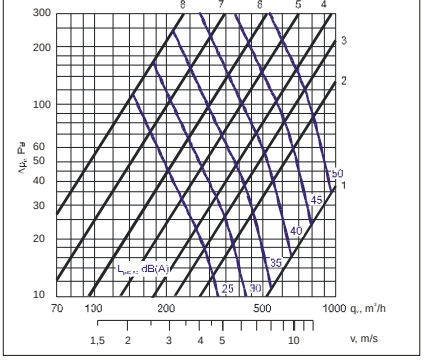
IRIS-125



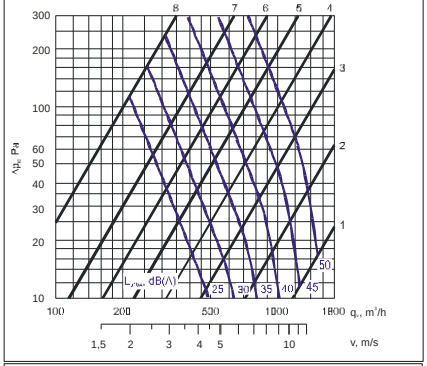
IRIS-150



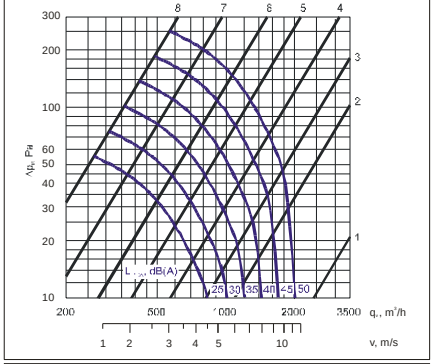
IRIS-160



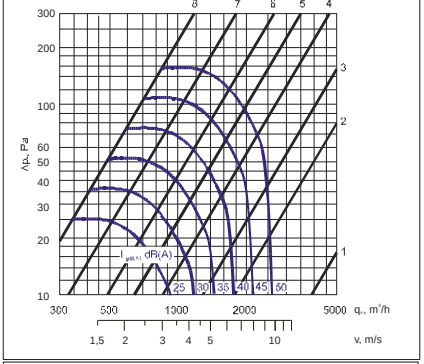
IRIS-200



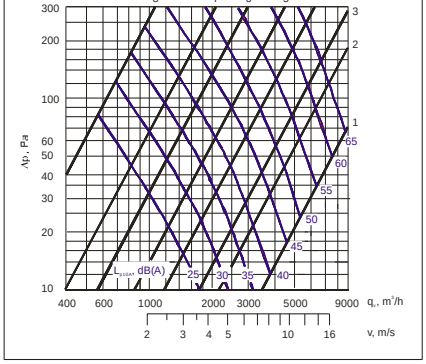
IRIS-250



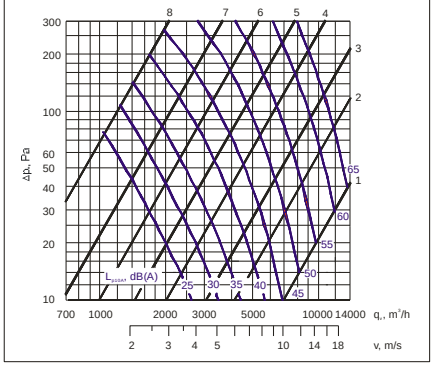
IRIS-315



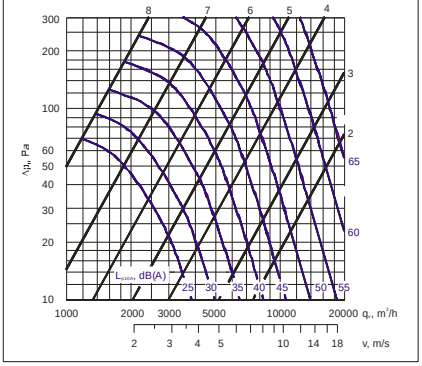
IRIS-400



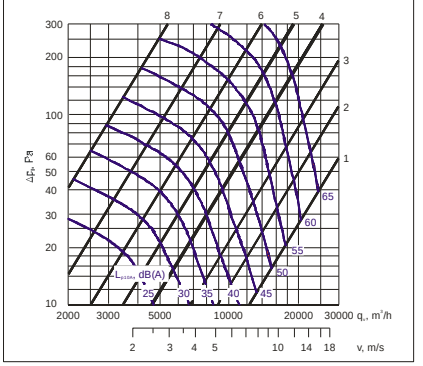
IRIS-500



IRIS-630



IRIS-800



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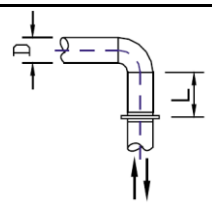
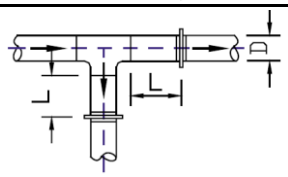
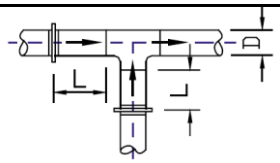
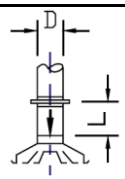
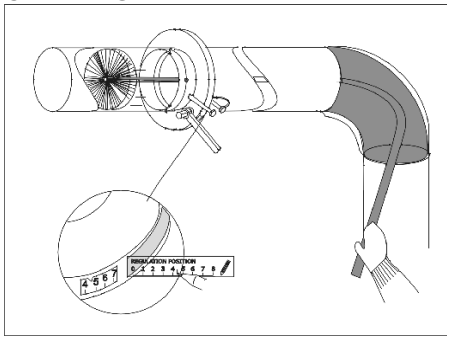
3.120 IRIS DAMPER Air Management

SAFETY DISTANCES

Type of flow disturbance	The required safety distance L	
	m^2= ± 7%	m^2= ± 10%
	≥ 1 D	≥ 1 D
	≥ 4 D	≥ 2 D
	≥ 2 D	≥ 2 D
	≥ 2 D	≥ 2 D

Accuracy of calibration during disturbance freeair flow ± 5%

CLEANING



To ensure the functioning of the inlet air diffuser

SYMBOLS		
q_v	air volume	(m^3/h)
L_{p10A}	sound pressure level with 4 dB room attenuation (10 m2sab room)	[dB(A)]
L_{woct}	sound power level in the duct	(dB)
K_{oct}	correction	(dB)
Δp_t	total pressure drop	(Pa)
Δp_s	static pressure drop	(Pa)
Δp_m	pressure difference	(Pa)
m_2	method-specific measurement tolerance	%
v	average velocity	(m/s)

SOUND CHARACTERISTICS								
IRIS	CORRECTION K_{OCT} (dB)							
	Medium frequency by octave band (Hz)							
	63	125	250	500	1000	2000	4000	8000
80	10	16	12	9	5	-1	-6	-23
100	25	21	16	9	4	-6	-12	-25
125	17	17	13	7	1	-4	-6	-17
150	21	20	14	8	0	-6	-16	-29
160	19	18	14	6	-1	-6	-13	-25
200	20	17	12	5	-2	-5	-14	-26
250	16	12	8	3	1	-4	-17	-32
315	24	12	5	0	1	-2	-13	-27
400	15	9	6	2	-1	-4	-9	-13
500	14	7	4	1	-1	-4	-8	-11
630	15	7	3	2	-1	-5	-9	-11
800	9	5	3	3	-1	-6	-10	-13
Tol.±	6	3	2	2	2	2	2	3

The sound power levels of the duct for every octave band are obtained by adding the corrections K_{oct} of octave bands (see table above) to the total sound pressure level L_{p10A} dB(A) according to the following formula:

$$L_{woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is the average in the range of use of the IRIS regulation and measuring device.

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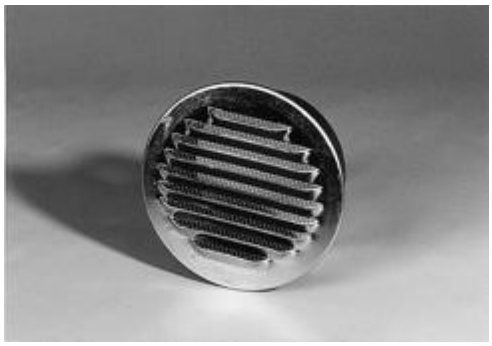
3.130 DWRA WEATHER PROTECTION GRILL

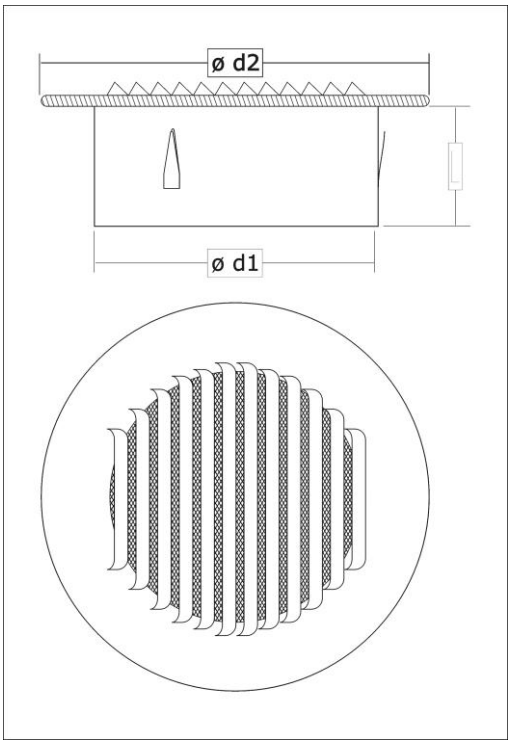
Air Management

WEATHER PROTECTION GRILL DWRA

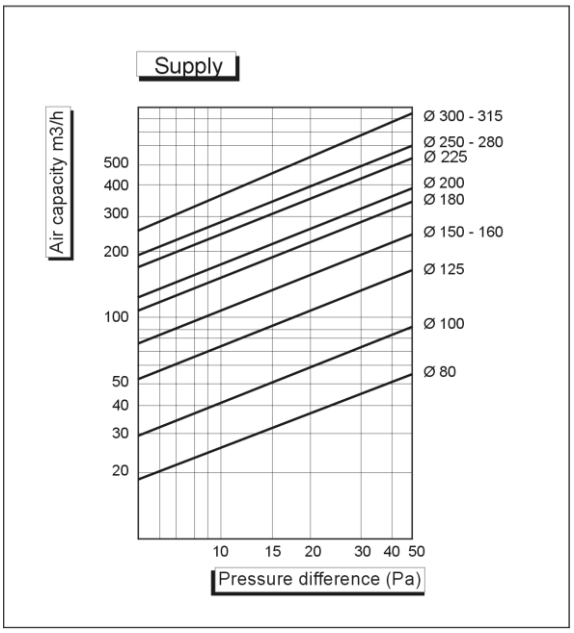
For exhaust and supply.
With connection bush, clamp fixing and wire gauze.
Every 3 Months the screen should be cleaned to prevent clogging!
Dimension = Dimension connection bush.
Material: Aluminium.

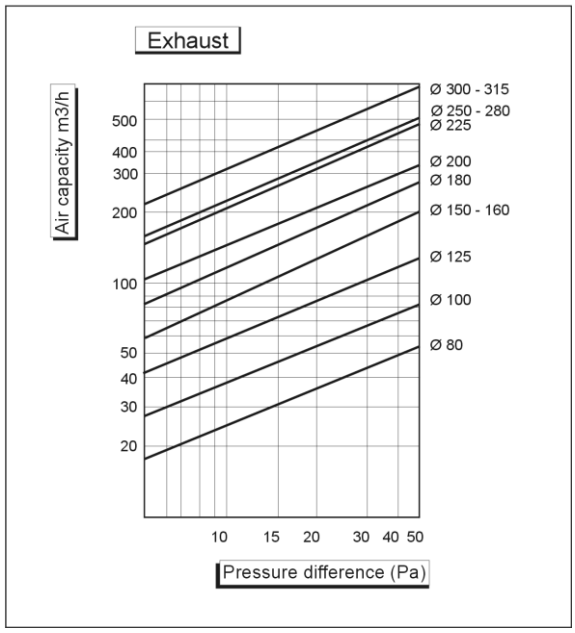


Dimension – and WEIGHT TABLE			
d1*	**d2 ± 2 mm**	**L ± 5 mm**	**weight (g)≈**
080	103	50	065
100	125	50	090
125	150	50	120
150	175	50	160
160	188	50	175
180	210	50	215
200	225	50	230
224	250	50	300
250	275	50	320
280	310	50	430
300	325	50	470
315	340	50	550



PRESSURE LOSS DIAGRAM





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3.141 BDS BACK DRAUGHT SHUTTER

Air Management

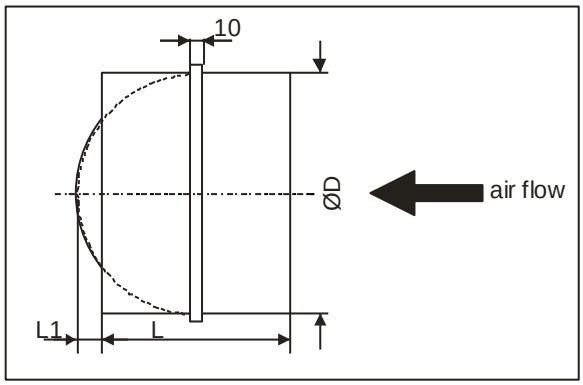
BACK DRAUGHT SHUTTER BDS.
The butterfly shutter type **BDS** is used to preventing the reverse of air-flow in circular duct systems.

CONSTRUCTION
The casing of the **BDS** has been constructed from galvanised steel. The blades are made of aluminium. The shaft and the spring are made of stainless steel. The butterfly shutter is fitted with a return spring, which closes the blades onto a sound absorbing ring.
Nominal diameters correspond to those in DIN 24145.
For production range and main dimensions see the tables.

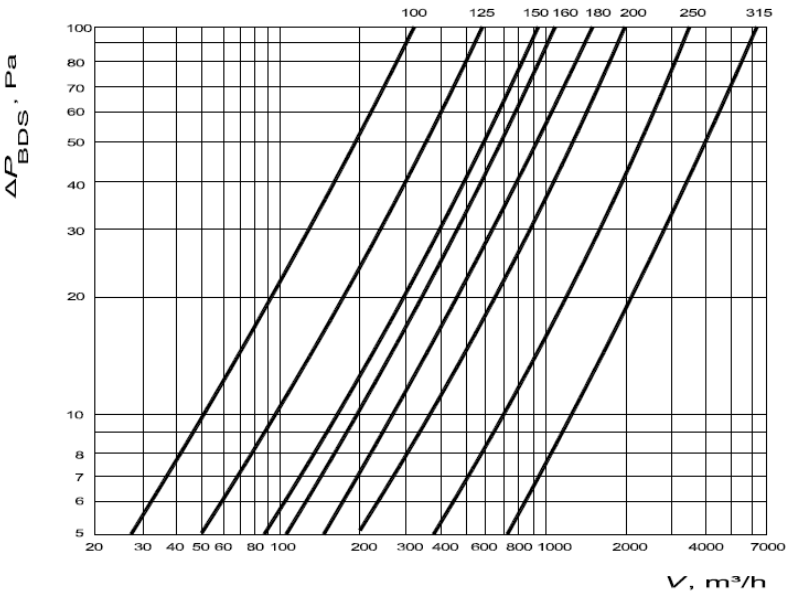
INSTALLATION
It is recommended to install the shutter into horizontal ducting. The shaft axis must be vertical. The shutter is installed into the duct by simple slide-in.

OPERATION CONDITIONS
The shutter is destined for operation in a standard environment with ambient temperature up to 60°C, for transportation of clean air free of coarse dust, grease, chemical vapours and other impurities.
The **BDS** is sold by the piece.

Type	ØD (mm)	L (mm)	L1 (mm)	Case thickness (mm)	Average weight
BSD-100	098.6±0.4	88	6	0.55	0.13 kg
BSD-125	123.6±0.4	88	19	0.55	0.17 kg
BSD-150	148.8±0.4	88	31	0.55	0.22 kg
BSD-160	158.6±0.4	88	36	0.55	0.24 kg
BSD-180	178.8±0.4	88	46	0.55	0.26 kg
BSD-200	198.6±0.4	88	56	0.55	0.29 kg
BSD-250	248.6±0.6	128	61	0.8	0.68 kg
BSD-315	312.7±0.6	128	94	0.8	0.81 kg
BSD-355	352.7±0.6	198	65	0.8	1.47 kg
BSD-400	398.7±0.6	198	94	0.8	1.68 kg
BSD-450	448.7±0.6	248	80	0.8	2.43 kg
BSD-500	498.7±0.6	248	107	0.8	2.76 kg



PRESSURE LOSS CHART



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3.142 BDSI INLINE BACK DRAUGHT SHUTTER

Air Management

INLINE BACKDRAUGHT SHUTTER TYPE BDSI.
The Inline backdraught shutter type **BDSI** is used to preventing the reverse of air-flow in circular duct systems.

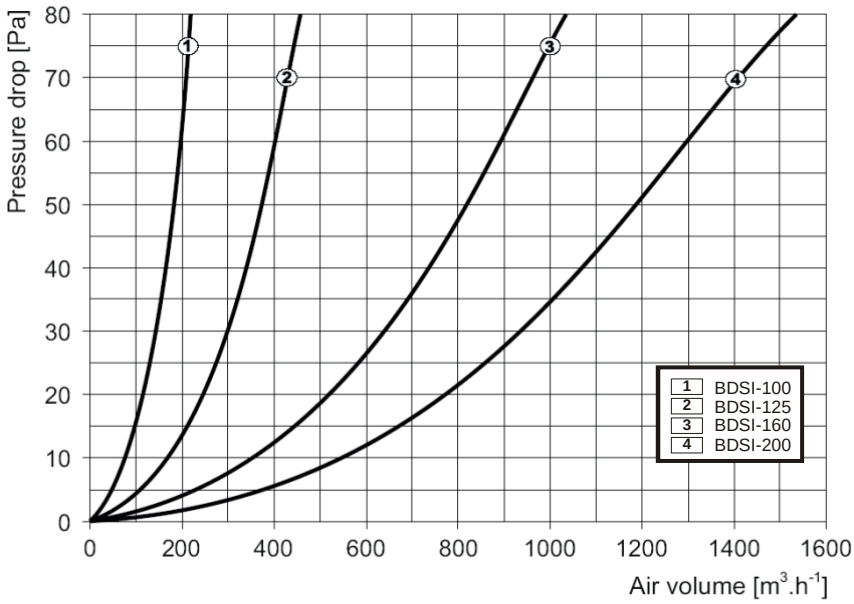
CONSTRUCTION
The casing of the shutter is made of galvanized steel sheet. The blades are made of aluminium, shaft and spring are made of stainless steel. The inner rubber seal is used for better tightness and for noise reduction. The outer foam sealing strip provides good tightening and fixing of the **BDSI** inside the duct.
The nominal dimensions correspond with the DIN 24145.
Production range and main dimensions see the table.

INSTALLATION
The **BDSI** has to be installed in horizontal position. The shaft axis must be positioned vertically.
The **BDSI** must be inserted fully into the duct.

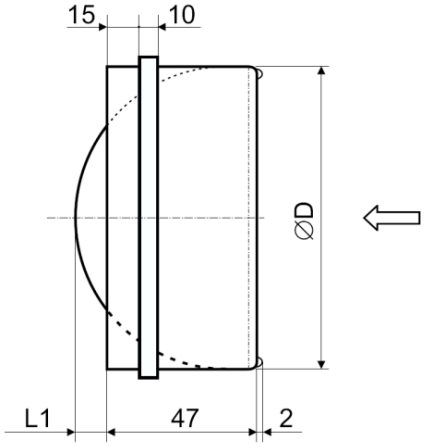
OPERATION CONDITIONS
The shutter is destined for operation in a standard environment with ambient temperature up to 60°C, for transportation of clean air free of coarse dust, grease, chemical vapours and other impurities.

The **BDSI** is sold by the piece.

PRESSURE DROP CHART



Type	ØD (mm)	L1 (mm)	Weight (kg)
BSDI-100	091	8	0.15
BSDI-125	116	17	0.20
BSDI-150	141	32	0.30
BSDI-160	151	37	0.40
BSDI-200	191	56	0.70



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3.150 DAM Quadrants **Air Management**

Type **DAM 010**
The metal **DAM 010** can be mounted without any other tools in:
- Rectangular ducts in all sizes.
- Round ducts from diameter 200 mm (*other sizes after adjusting, see mounting instructions)*
- Ducts with inner insulation.
- Ducts with outer insulation.
- Not insulated ducts.

Advantages of the DAM 010:
- Multipurpose and reliable
- No air leakage
- Efficient and fast to mount

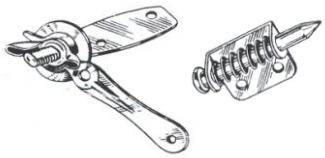
Type **DAM 020**
The nylon(6.6) **DAM 020** is suitable for:
- Round ducts up to max. Ø 250 mm.
- Rectangular ducts in all sizes.
- Application in combination with blades out of steel plate up to 1 mm thickness.

Advantages of the DAM 020
- Quick mounting because of single bearing
- Solid construction
- No air leakage
- Position lever is always the same position as the blade

Also Available for the DAM020:
- **DAMCO** : Contra bearing to stabilize valve.
- **DAMRING** : O-Ring / Sealing ring.

DELIVERY PROGRAM
The **DAM 010** and the **DAM 020** are deliverable from stock.

Type **DAM 030**
The metal **DAM 030**, exists out of an axl with propeller wire, feather, rings and wingnut. Easy assembling without further appliances in: rectangular canals with all dimensions and round canals up to diameter 250 mm



*Type **DAM 040 & DAM 050***
The metal DAM 040 and DAM 050, existing out of round digitplate, oval axl without propeller wire, feather, screw bold and wingnut. Easy assembling without further appliances in: rectangular canals with all dimensions and round canals up to diameter 300mm (DAM040) and diameter 500mm(DAM050).

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3.151 DAMKSP/KSK ADJUSTABLE VALVES

Air Management

ADJUSTABLE VALVES
Circular blade duct dampers, manually operated quadrants. In closed position the blades of both types has 10% less diameter than the casing has.

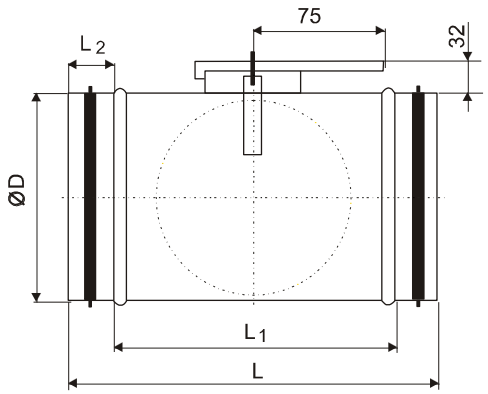
CONSTRUCTION DAM KSP
Damper with a nylon based quadrant housing and axle. The blade is fixed by the nylon axle at one side with twenty four fixed positions, between fully open and closed. The adjusting of the blade can be fixed with a 5 mm self drilling screw. The damper is used primarily for air flow control in the duct. It is suitable for low en medium velocity installations. To support the sealing of the connection with the duct, the damper has been fitted with T-shape rubber. The greatest advantage is the short build-in length.

CONSTRUCTION DAM KSK
Damper with a galvanised based quadrant housing, blade and aluminium axle.
The axle has been situated in polyamide bearings at both sides. The quadrant has stepless positions, between fully open and closed. The adjusting of the blade can be fixed with a wing nut. The damper is primarily suitable for airflow control in the duct and for low, medium and high velocity installations. To support the sealing of the connection with the duct, the damper is fitted with T-shape rubber. The greatest advantage is the short build-in length. For product series and nominal dimensions, conform to DIN 24145, see the tables.

INSTALLATION: The damper can be fitted directly to circular ducting.

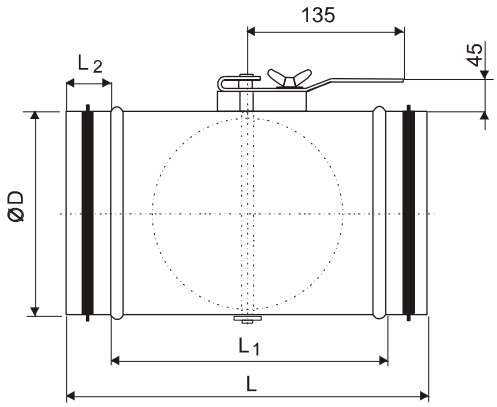
Type DAM KSP

Type	ØD (mm)	L (mm)	L1 (mm)	L2 (mm)	Case thickn. (mm)	Average weight (kg)
DAM KSP-100	100	200	120	40	0.55	0.4
DAM KSP-125	125	200	120	40	0.55	0.5
DAM KSP-140	140	200	120	40	0.55	0.5
DAM KSP-150	150	200	120	40	0.55	0.6
DAM KSP-160	160	200	120	40	0.55	0.6
DAM KSP-180	180	200	120	40	0.55	0.6
DAM KSP-200	200	200	120	40	0.55	0.7



Type DAM KSK

Type	ØD (mm)	L (mm)	L1 (mm)	L2 (mm)	Plaat dikte (mm)	Massa (kg)
DAM KSK-080	80	250	170	40	0.55	0.4
DAM KSK-100	100	250	170	40	0.55	0.6
DAM KSK-125	125	250	170	40	0.55	0.7
DAM KSK-140	140	250	170	40	0.55	0.8
DAM KSK-150	150	250	170	40	0.55	0.8
DAM KSK-160	160	250	170	60	0.55	0.9
DAM KSK-180	180	250	170	60	0.55	1.0
DAM KSK-200	200	250	170	60	0.55	1.2
DAM KSK-224	224	250	170	60	0.55	1.5
DAM KSK-250	250	350	230	60	0.8	2.2
DAM KSK-280	280	350	230	60	0.8	2.8
DAM KSK-315	315	350	230	60	0.8	3.2
DAM KSK-355	355	350	230	60	0.8	4.3
DAM KSK-400	400	600	440	80	0.8	6.1
DAM KSK-450	450	600	440	80	1.0	8.1
DAM KSK-500	500	600	440	80	1.0	9.2
DAM KSK-560	560	600	440	80	1.0	10.3
DAM KSK-630	630	600	440	80	1.0	12.5



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3.160 IPD ACCESS DOORS

Air Management

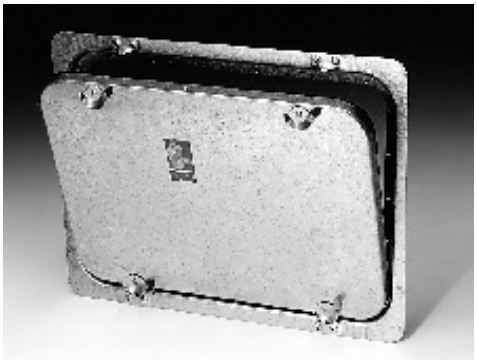
ACCESS DOORS are used in air duct systems for controlling fire dampers, control and shut off dampers, batteries and other parts of a duct system.

CONSTRUCTION

ACCESS DOORS have been constructed from a galvanized frame with a double-walled panel, which has been fastened into the frame airtight. The frame will be fixed into the duct. The panel has been performed double-walled. In order to get a good thermic insulation a filling of a 25 mm glasswool has been added. A sealing ring, fixed to the panel provides an air tight sealing until 2000 Pa. Quick-acting closures see to that taking off and putting back the panel will take no more than a second.

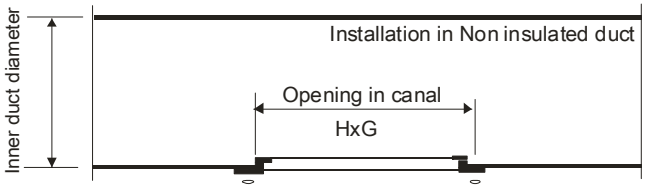
DELIVERYPROGRAM

ACCESS DOORS are deliverable in four different sizes. The sizes which are in great demand, the **IPD1**, the **IPD2** and the **IPD3** are deliverable from stock.

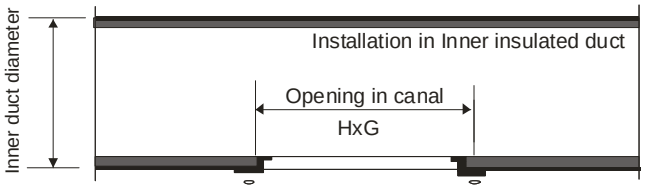


Model	A x B	C x D	E X F
IPDO	463 x 608	500 x 649	548 x 699
IPD1	327 x 463	368 x 500	418 x 548
IPD2	198 x 332	240 x 375	286 x 422
IPD3	116 x 206	150 x 240	195 x 288

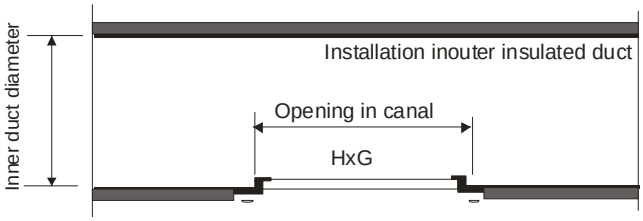
Model	H x G
IPD 0	655 x 505
IPD 1	505 x 375
IPD 2	380 x 245
IPD 3	245 x 155

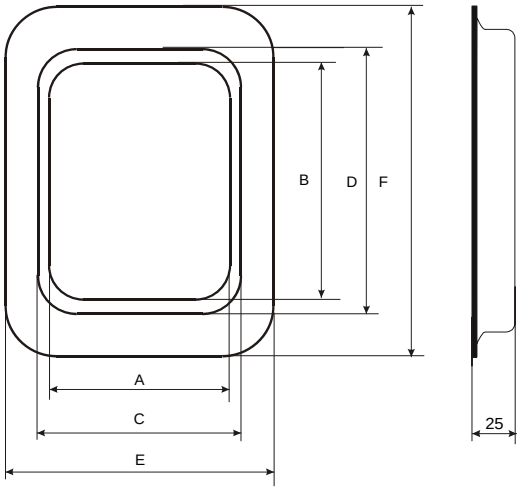


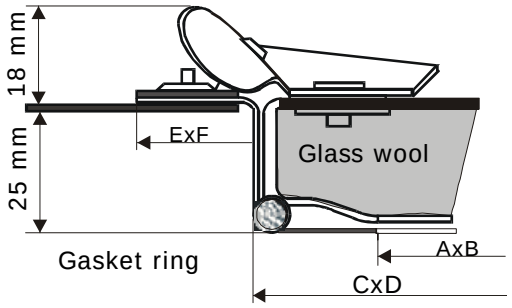
Model	H x G
IPD 0	655 x 505
IPD 1	505 x 375
IPD 2	380 x 245
IPD 3	245 x 155



Model	H x G
IPD 0	610 x 465
IPD 1	465 x 330
IPD 2	335 x 200
IPD 3	210 x 120







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3.161 IPDC/IPDF ACCESS DOORS

Air Management

ACCESS DOORS are used in air duct systems for controlling fire dampers, control and shut off dampers, batteries and other parts of a duct system.

CONSTRUCTION
ACCESS DOORS have been constructed from a galvanized frame with a double-walled panel. Available in flat or curved model.
Quick-acting closures see to that taking off and putting back the panel will take no more than a second.

- Temperature range: -70C up to +70C Celsius
- Air-tightness: Correctly installed access doors are air-tight up to at least +5000 Pa and at least -5000 Pa (500mm w.g.)
- Self-adhesive drilling template in each bag

Gasket:
Material: cellular polyethylene foam with an acrylate-dispersion self-adhesive side
Color: white
Temperature range: -70C up to +70C Celsius
Weathering resistance: very good
Knobs:
Material: Polyamid with steel threads
Color: red
Temperature range: -70C up to +70C Celsius

DELIVERYPROGRAM
ACCESS DOORS are deliverable in several different sizes.

Art. code:

IPDF200x100:	Flat Accessdoor 200x100mm
IPDF300x200:	Flat Accessdoor 300x200mm
IPDF400x300:	Flat Accessdoor 400x300mm
IPDF500x400:	Flat Accessdoor 500x400mm
IPDF600x500:	Flat Accessdoor 600x500mm

Art. code:

IPDC180X80-10:	Curved Accessdoor for Ø 100mm
IPDC180X80-12:	Curved Accessdoor for Ø 125mm
IPDC200X100-14/15:	Curved Accessdoor for Ø 140mm upto 150mm
IPDC200X100-16/18	Curved Accessdoor for Ø 160mm upto 180mm
IPDC200X100-20/22	Curved Accessdoor for Ø 200mm upto 224mm
IPDC200X100-25/28	Curved Accessdoor for Ø 250mm upto 280mm
IPDC200X100-31/35	Curved Accessdoor for Ø 315mm upto 355mm
IPDC300X200-31:	Curved Accessdoor for Ø 315mm
IPDC300X200-35:	Curved Accessdoor for Ø 355mm
IPDC300X200-40:	Curved Accessdoor for Ø 400mm
IPDC400X300-40:	Curved Accessdoor for Ø 400mm

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3.170 DSAV EXTERNAL LOUVRES

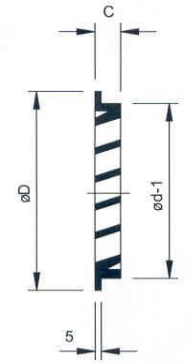
Air Management

EXTERNAL LOUVRES DSAV
External louvres are used as covering grilles in air supply and exhaust openings.

CONSTRUCTION
The **DSAV** is moulded of aluminium and has a strong design.
The **DSAV** is also available as **coated grey** (**DSAVØC**) and **KTL-black** (**DSAVØB**) versions.
The standard external louvres are equipped with insect screen (pitch 2mm steel zinc plated).
The **DSAV** is also available with screen 'pitch' 10mm steel zinc plated (**DSAV10.Ø**).
Every 3 Months the screen should be cleaned to prevent clogging!
With the **DSAV**, the insect screen has to be removed in mechanical ventilation when used for supply air.

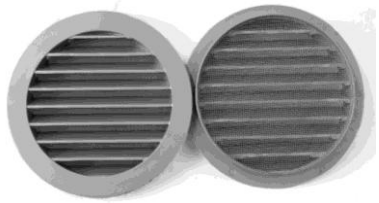
INSTALLATION
The **DSAV** is fitted by nails or by casting.

Size Ød	ØD (mm)	C (mm)	Weight (gr)
DSAV50	65	14	60
DSAV63	70	14	60
DSAV70	85	14	90
DSAV80	101	14	115
DSAV100	132	25	165
DSAV125	155	25	235
DSAV150	175	20	360
DSAV160	190	25	410
DSAV200	230	25	490
DSAV250	280	28	740
DSAV315	350	20	1940



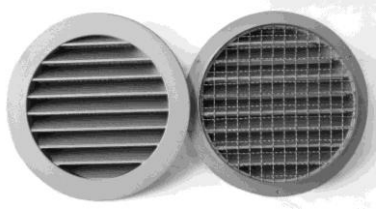
DSAV

DCAVØC

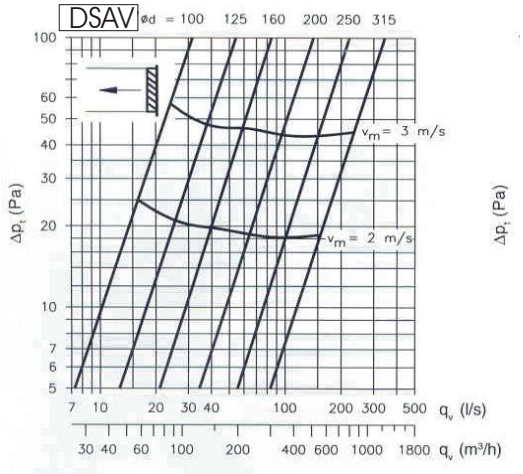


DCAVØBC

DCAV10.Ø



SELECTION DIAGRAM



DEFINITIONS

q_v	air flow	(l/s),(m^3/h)
Δp_t	total pressure drop	(Pa)
v_m	average velocity in the duct	(m/s)
B	width	(mm)
H	height	(mm)

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3.180 DFB PLATE FILTER BOX

Air Management

PLATE FILTER BOX DFB

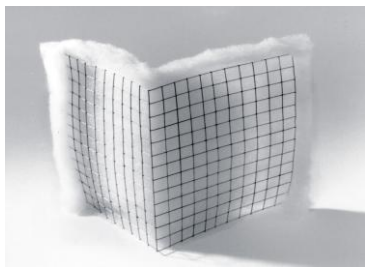
The **PLATE FILTER BOX DFB** is suitable to fit into a circular duct system, where a lower particle separation rate is sufficient. Due to its small size the **DFB** is suitable in areas with limited space.

CONSTRUCTION

The casing of the **DFB** has been constructed from galvanised steel. The cover is fixed to the casing by a simple clamp. This enables an easy access to the filter, without using any tools. To support the sealing of the connection to the duct the casing has been fitted with a T-shape rubber. For product series and nominal dimensions, conform to DIN 24145, see the tables.

FILTER

Filtration class :G4, other classes on request
Particle separation rate :70%
Max. temperature :100□C
Material :synthetic fibre non-woven cloth
Cleaning :dry mechanic way, e.g. by vacuum cleaner



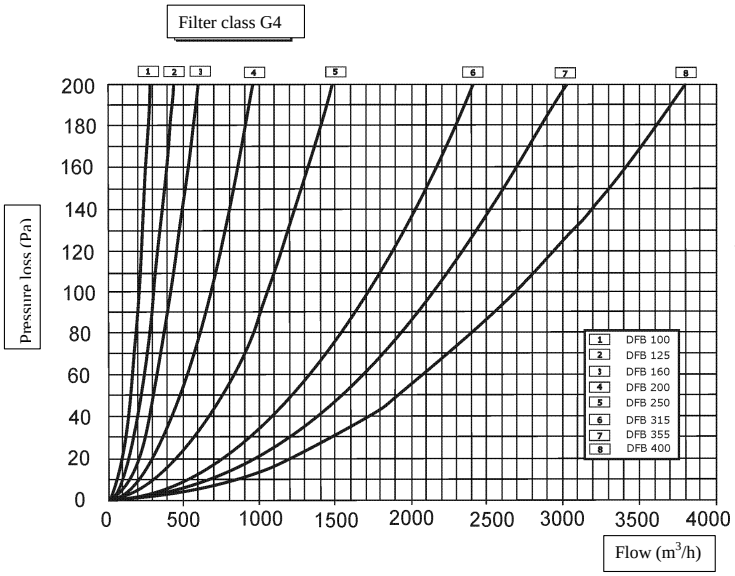
Cleaning/exchange interval :
when the pressure loss is twice the clean filter value

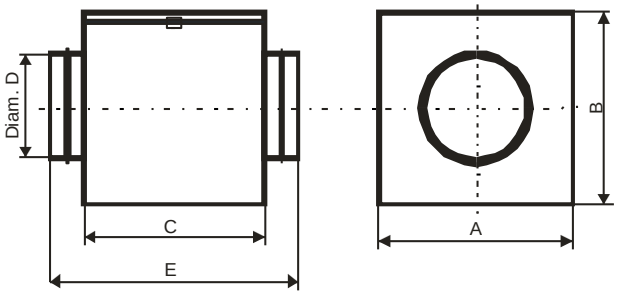
INSTALLATION

The air filter has to be installed in the duct system before the fan and heat exchangers. It is necessary to keep the air flow direction (marked on the casing) and to leave enough access to the filter for cleaning and filter exchange purposes.

Spare pocket filter	
Type	**Dimensions (mm)**
DFBSF -100	280 x 175
DFBSF -125	320 x 210
DFBSF -160	360 x 240
DFBSF -200	440 x 280
DFBSF -250	540 x 330
DFBSF -315	725 x 395
DFBSF -355	1010 x 500
DFBSF -400	1010 x 500

Type	ØD (mm)	A (mm)	B (mm)	C (mm)	E (mm)	Weight (kg)
DFB -100	100	211	170	120	195	2.1
DFB -125	125	221	205	140	215	2.1
DFB -160	160	271	235	155	230	2.3
DFB -200	200	321	275	180	311	3.5
DFB -250	250	368	323	230	361	3.5
DFB -315	315	431	390	330	461	6.1
DFB -355	355	521	495	455	586	8.4
DFB -400	400	521	495	455	586	8.4





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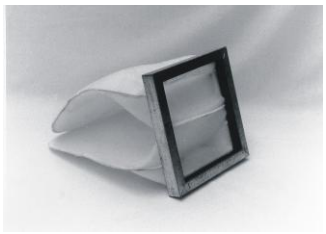
3.181 DFBP POCKET FILTER BOX

Air Management

The **pocket filter box DFBP** is appropriate for fitting into a circular duct system.

CONSTRUCTION
The pockets of the filter are fitted into a frame of galvanized steel. They have been reinforced by steel wire to ensure a maximum use of the filter area. The cover is fixed to the casing by simple clamps. This enables an easy access to the filter, without using any tools. To support the sealing of the connection with the duct, the filter has been fitted with T-shape rubber. For product series and nominal dimensions, conform to DIN 24145, see the tables.



POCKET FILTER
The pockets of the filters are fitted into a frame of galvanized steel. They have been reinforced by steel wire to ensure a maximum use of the filter area.

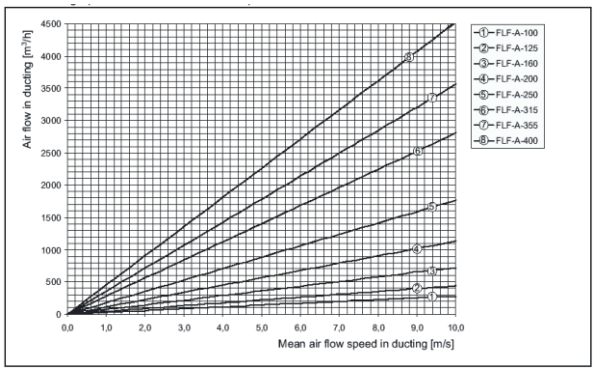
Filtration class:	:G4, other classes on request
Particle separation rate:	:90%
Max. temperature	:100°C
Material	:synthetic non-woven cloth
Cleaning	:dry mechanic way e.g. by vacuum cleaner
Cleaning/exchange interval	:when the pressure loss is twice the clean filter value

INSTALLATION
The air filter has to be installed in the duct systems before the fan and the heat exchangers. It is necessary to keep the air flow direction (marked on the casing) and to leave enough access to the filter for cleaning and exchange purposes.

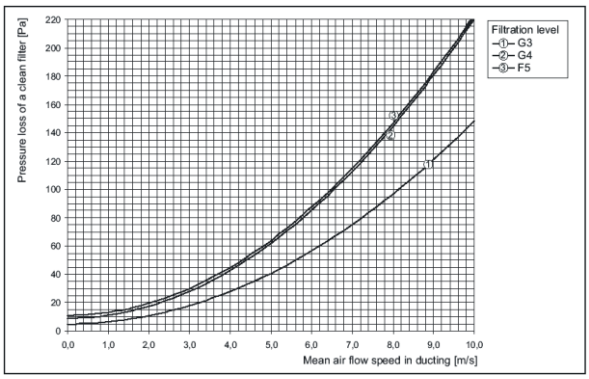
Type	ØD (mm)	A (mm)	B (mm)	C (mm)	E (mm)	Weight (kg)
DFBP -100	100	204	204	400	480	3.5
DFBP -125	125	204	204	400	480	3.5
DFBP -160	160	294	295	400	480	4.3
DFBP -200	200	294	295	400	480	4.3
DFBP -250	250	424	385	480	600	5.2
DFBP -315	315	424	385	480	600	5.2
DFBP -355	355	504	505	600	720	6.6
DFBP -400	400	504	505	600	720	6.6

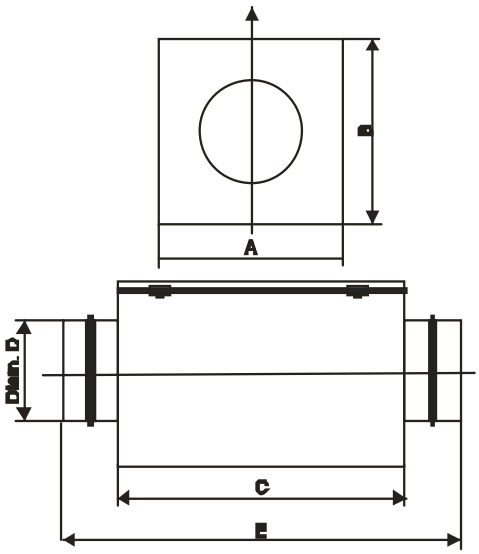
Spare pocket filter	
Type	**Dimensions (mm)**
DFBPSF -100	198 x 198 x 340
DFBPSF -125	198 x 198 x 340
DFBPSF -160	288 x 288 x 340
DFBPSF-200	288 x 288 x 340
DFBPSF-250	418 x 387 x 440
DFBPSF-315	418 x 387 x 440
DFBPSF-355	498 x 498 x 540
DFBPSF-400	498 x 498 x 540

Conversion diagram airflow



Pressure loss diagram





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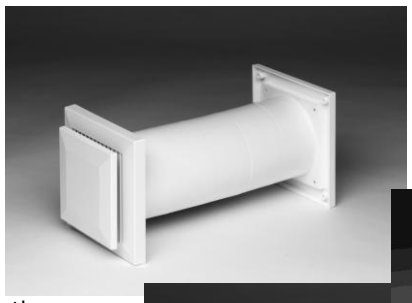
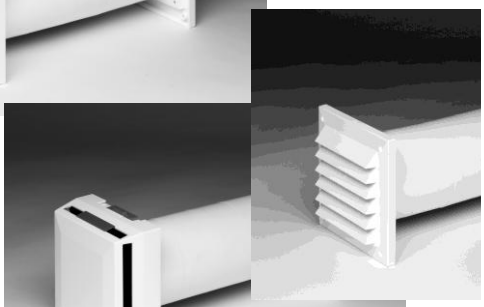
3.190 DTL98 - AIR INLET Air Management





The air inlet is a ventilation unit designed to provide a continuous flow of air into a building. The unit can be installed in bedrooms, livingrooms or any other kind of room in need of ventilation. It is recommended that the unit is placed high up, preferably in suitable relationship to a radiator. This mixes the incoming air with the convection flow of warm air, ensuring maximum comfort.

Air inlet. (Ordering number**: DTL98E)**
This unit consists of an interior section, three pipes end a louvre vent, which incorporates a flyscreen. The interior part includes a cover fitted with a condensation screen. This cover functions as a damper and also directs the airflow. The volume of air is set by moving the cover to the requested position, the direction of the airflow is controlled by adjusting the cover to the required angle.

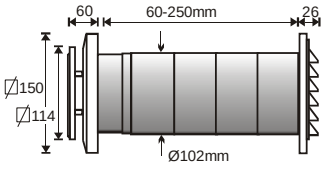
Air inlet with filter and precision damper**.**
(Ordering number**: DTL98P)**
This unit consists of a precision damper and filter, five pipes and a louvred vent. Each ventilator includes 3 air-direction plugs and a locking plate, which fixes the unit in the required position. It can be regulated by means of a cord, which is supplied as standard.

Function DTL98P.
The incoming air flows along the innerwall, where it is warmed and spread to the rest of the room. The spread of air can be varied by mounting the airdirection plugs in the air stream of the housing. The unit is fitted with a precision damper for exact adjustment of the airflow. This is done by means of scale on the cover and the adjustment diagram.
The damper is actuated by a regulator situated on the underside of the air inlet. It can also be adjusted by a hanging cord if required. The housing is also fitted with a minimum flow stop at position 2, in order to ensure a certain minimum ventilation. At this point the flow is c.3 lit./sec. at 10Pa. If the air inlet needs to be closed completely for any reason, the stop can be overcome by pressing the regulator harder towards the 0 position. To adjust the air inlet to a fixed flow, remove the regulator grip and replace it with a locking plate to prevent the damper being reset.

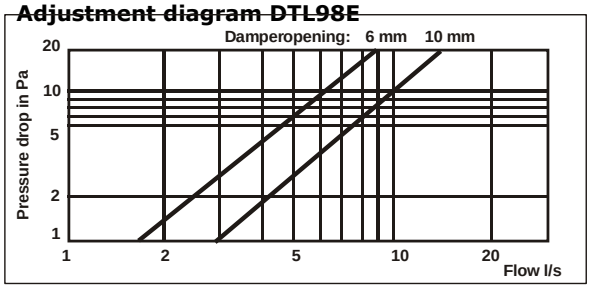
Maintenance.
The housing is easy to clean. The cover and the filter can be pulled off together. It is then easy to separate them and to replace them. It is important to keep the filter clean (wash-and replace when necessary), in order to ensure the correct flow of air and to retain good air quality.

TECHNICAL DATA:

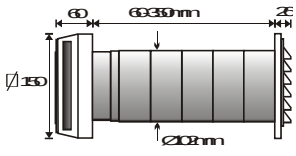
DTL98E
-Capacity at 10Pa
Fully open, 12 mm: 9,8 l/s
Half open, 6 mm: 6,2 l/s
-Mounting Hole: 105mm
-Max. wall thickness: 250mm.
(for thicker walls you can add pipes.)
-Condensation screen.



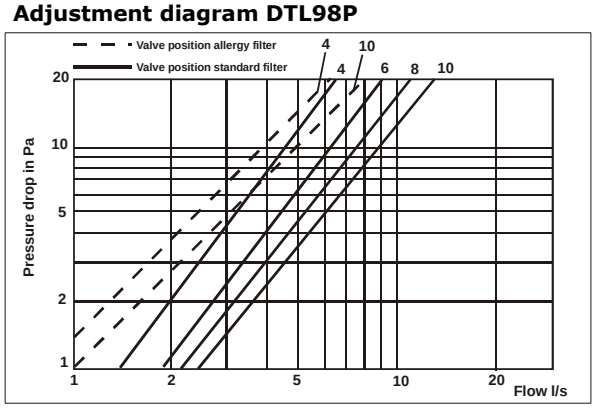
Adjustment diagram DTL98E



DTL98P
-Capacity at 10Pa
Fully open, position 10: 8,8 l/s
Half open, position 5: 6,2 l/s
-Mounting Hole: 105mm
-Max. wall thickness: 350mm.
(for thicker walls you can add pipes.)
-Adjustable spread pattern.
-Condensation screen.
-Filter



Adjustment diagram DTL98P



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3.190 DTL98 - AIR INLET Air Management

INSTALLATION:
The air inlet should be mounted high up, preferably in suitable relation to a heating unit.

DTL98E
1. Hole diameter.
Cut a hole through the wall 105mm in diameter, slanted downwards slightly (1mm/100mm) in the outward direction. Use a hole saw or drill a ring of small holes remove the core using a chisel etc.

2. Mounting the outer parts.
Press the outer muff on the louvred vent. Fit further pipes so that the total length is just slightly less than the wall thickness. Insert the vent and pipes through the wall from the outside. Fix the vent in place using four of the screws supplied. Seal between the vent and the façade with sealing compound where necessary.

3. Mounting the interior part.
Loosen the inner adapter from the interiorpart. Mount the adapter and fix in place with the remaining four screws. Press the interior part back onto the adapter. If the interior part is to be secured, first remove the cover, then the part can be fixed in place using the two small screws supplied.

DTL98P
1. Hole diameter & 2. Mounting the outer parts (Same as **DTL98E** !)

3. Mounting the inner parts.
Loosen the cover from the chassis. Press the inner adapter on to the back of the chassis. Fit the inner part and fix in place using the remaining four screws.
Refit the cover and set the required air flow by means of the regulator and the
scale.

4. Adjustment.
If a fixed setting is required, this can be set as follows:
Bend the regulator away using the fingers or a small screwdriver.
Adjust to setting required by moving the regulator tab along the scale.
Fit the locking plate, pressing if firmly in place.

5. Fitting the cord (handicap adaption).
Remove the cover.
Open the pre-marked holes (one each side of the regulator) using a bradawl or a 2mm drill. Thread one end of the cord through each hole and tie a knot behind the equivalent hole in the ring. Use triple overhand knots.

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3.200 SMOKEDEC **Air Management**

The **SMOKEDEC** is an efficient and a simple tool to visualize, movements of air such as leakage of ventilation systems and chimneys.

- Air flow around grids during balancing of the A/C system.
- Leakage in a high-pressure hose.
- Checking the flow of chimney's.
- Controlling of boilers.
- Conserving energy: draught from doors and windows.

FUNCTION

Each cartridge emits generous amount of greyish-white smoke with almost the same density as air to be able to visualize movements of air streams without rising or falling. The greyish-white colour is visible, even in dark corners.
The smoke is ionized and oil-free and is emitted in a constant stream

INSTRUCTION

Place one smokedec cartridge on a non combustable place. Light up the cartridge for the choosen smoking time.
Never use SMOKEDEC unattended.

WARNING

Use this product ONLY in a professional way (see instructions). Avoid any contact and inhaling of the smoke. The room must be ventilated properly afterwards. Keep product under lock and key.

Preventing measurements:
- Possibility to rinse eyes.
- Using gloves.
- Keep fire exstinguisher stand-by.

Smokedec	Burningtime	Smokevolume	Weight of 1 cartr.	In pack of
SM045	45 sec	5 m^3/h	3 Gr	10 x10
SM065	65 sec	17 m^3/h	10 Gr	10 x 10
SM150	180-240 sec	17 m^3/h	20 Gr	10 x 5
SM240	180-240 sec	55 m^3/h	58 Gr	10 x 5
SM300	360-480 sec	500 m^3/h	454 Gr	6 x1

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3.210 DMK - PIPE/FAN CONNECTOR

Air Management

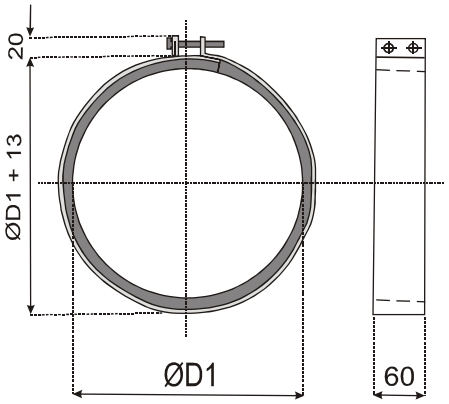
This **coupling collar** serves for connecting of a fan with a circular duct in the same diameter and at the same time it is of service for decrease of a transfer of vibrations from a fan to duct. The advantage of this type of connection is a possibility to take the fan out of the air ditribution system at any time by reason of some revision, reparation or exchange.

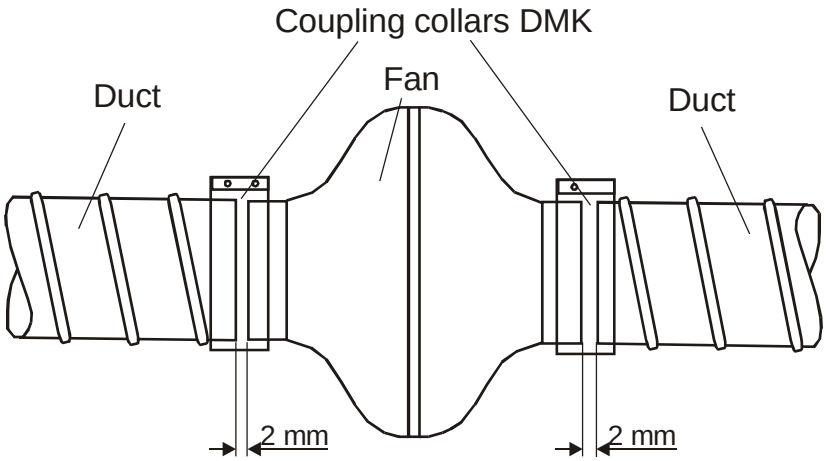
CONSTRUCTION
The collar is made of galvanized steel sheet, sticked with a foam polyethylene sealing of a thickness 6 mm on its inward side. For a fixation of the collar serves two screws M6 stepped into the ends of the collar: screws as well as nuts are parts of the product. The general constructional settlement of a collar guarantees a high strenght of the construction.

OPERATION CONDITIONS
The Pipe\fan connector is destined for operation in a standard environment with ambient temperature up to 60°C, for transportation of clean air free of coarse dust, grease, chemical vapours and other impurities.

INSTALLATION
Wind a collar round a collet of a fan and a connecting duct, between them must be an interspace around 2 mm. Clep a screwhead to the cutting on the end of a collar. Wear both screws out in turns so that the connection is hard-set and tight enough and that any deformation of a collar cannot occur.

Type	ØD1 mm	Sheet mm	Weight kg
DMK100	100	0.55	0.14
DMK125	125	0.55	0.16
DMK150	150	0.55	0.19
DMK160	160	0.55	0.20
DMK180	180	0.55	0.22
DMK200	200	0.55	0.23
DMK224	224	0.55	0.24
DMK250	250	0.55	0.27
DMK315	315	0.55	0.32
DMK355	355	0.55	0.40
DMK400	400	0.55	0.45





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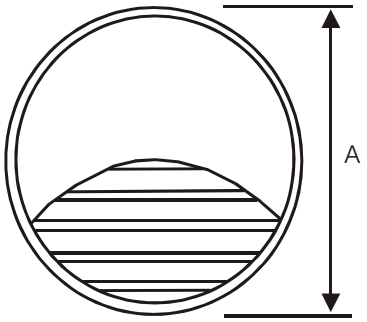
3.220 EXTERNAL LOUVRE WITH INSECTSCREEN

Air Management

Round external louvre with insectscreen .

Stainless steel construction for wall mounting.
For exhaust and supply.
With connection bush, clamp fixing and wire gauze.
Material: Stainless steel 304/2B.
Louvre is packed in a transparent bag.
Including 2 stainless steel screw.
Every 3 Months the screen should be cleaned to prevent clogging!

Ordering code	Type mm	D(dia) mm	A(dia) mm	C mm	E mm	Q M^3/h	Weight Gr.
D579311	100	100	150	115	42	60	161
D579611	125	125	190	145	48	80	258
D579811	150	150	210	155	55	125	346
D579911	160	155	210	165	55	135	346
D579211	200	195	253	205	62		930
Airflow (Q) selected by Veff = 4m/sec.							



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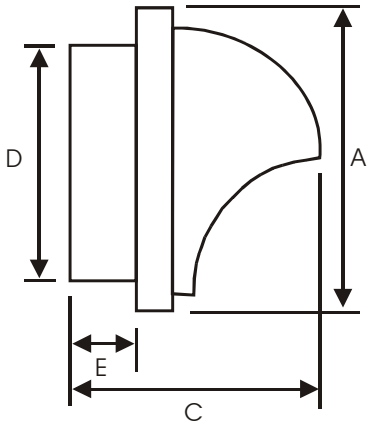

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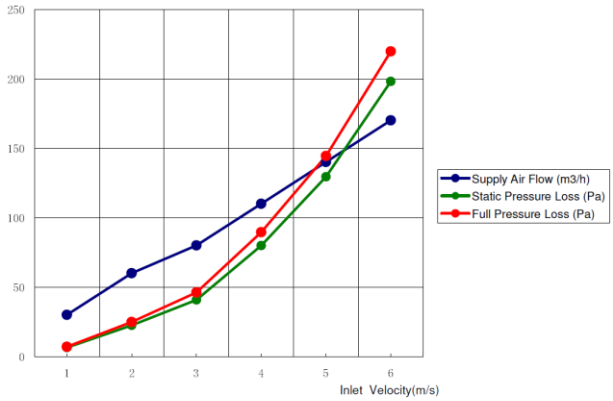
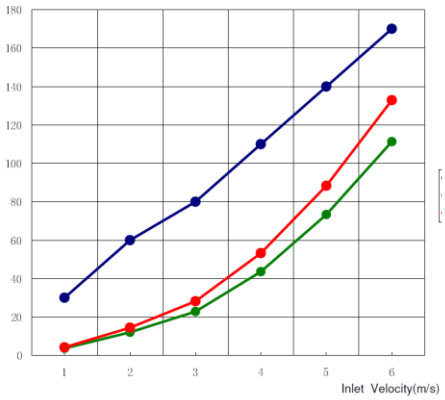
3.220 EXTERNAL LOUVRE WITH INSECTSCREEN

Air Management





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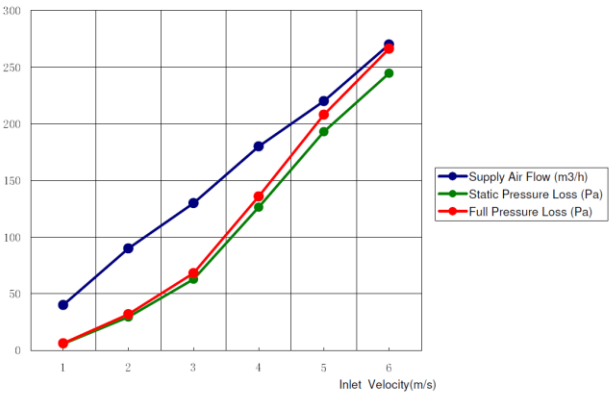

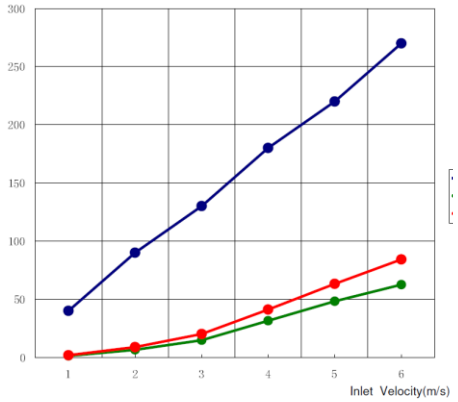

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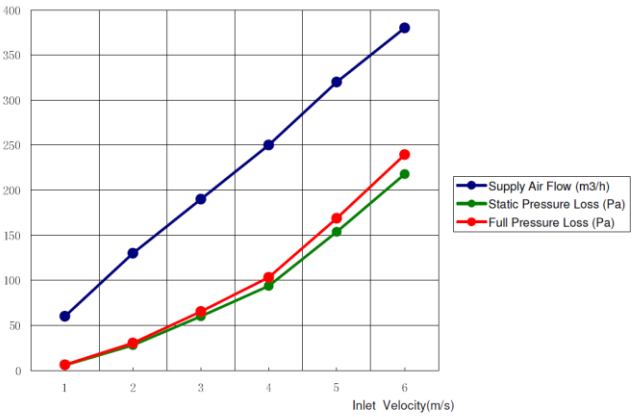
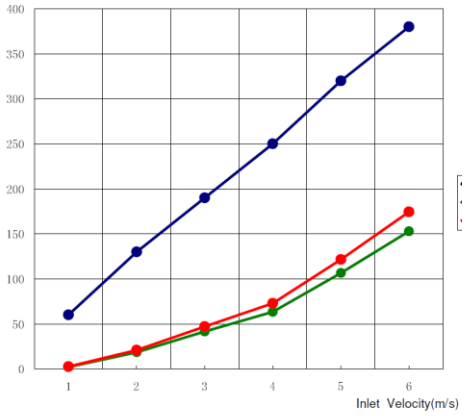
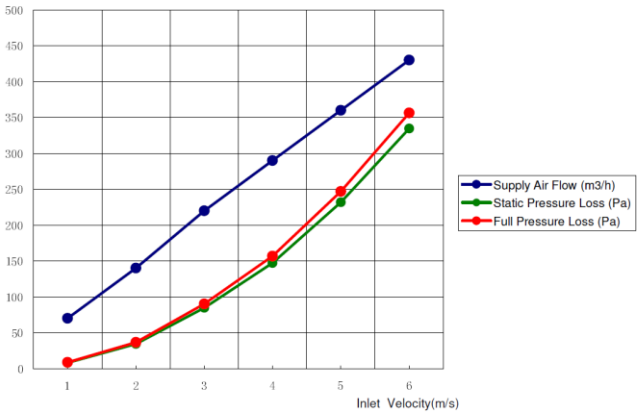
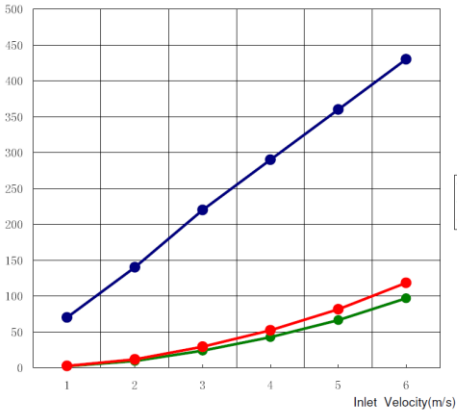




Diam. 160

DIAM.160





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3.230 DVR(V) - PLASTIC VENTILATION GRILLS

Air Management

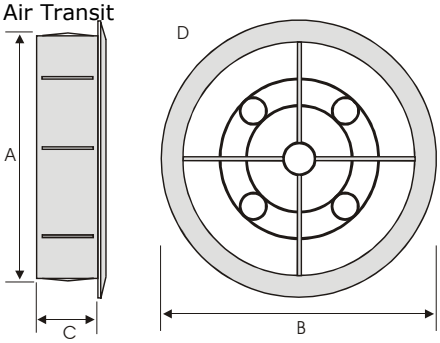
PLASTIC VENTILATION GRILL (DVRØ).

For exhaust and supply. Color: White
Material: PolyPropylene
Articlecode**: DVR{Ø}**

Dimensions.

Type mm	A mm	B mm	C mm	D cm^2
DVR100	100	124	30	65
DVR120	120	147	30	90
DVR150	150	185	30	130

Air Transit

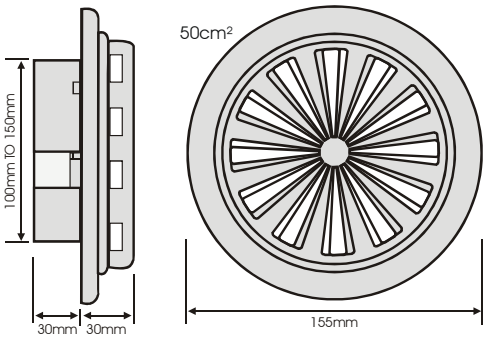


PLASTIC ADJUSTABLE VENTILATION GRILL (DVRV).

For exhaust and supply.
Variable volume flow control by turnable frontcover. Color: White
Material: PolyPropylene
Articlecode: DVRV

Dimensions.
Multi-fit/adjustable connection bush for diameters from 100mm up to 150mm.

Air Transit



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3.240 DMR - CONSTANT VOLUME DAMPER

Air Management

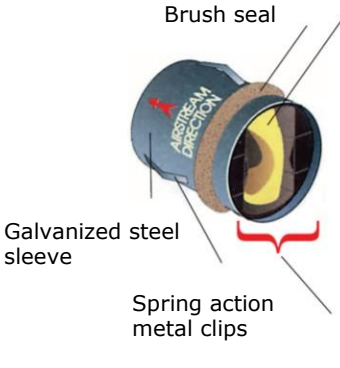
The **DMR** Simplifies Controlling Airflows

- Automatically regulates airflows in low pressure systems.
- Eliminates on-site balancing of forced air heating, cooling and ventilation systems.
- No electrical or pneumatic controls.
- Simple maintenance-free design.
- Simplifies design engineering and compensates for minor errors.
- The DMR may be installed in either horizontal or vertical ducts. Gravity has no influence on its operation.

DESCRIPTION

The DMR is a device that automatically regulates airflows in ductwork to constant levels. Operation is completely passive. No electric or pneumatic sensors or controls are needed. The DMR provides a low cost solution to ballancing forced air systems, air conditioning and ventilation, eliminating the need for onsite balancing. To a large degree, it compensates for changes in duct pressure due to thermal stack effect, building pressure, dust clogging of filters, etc.
The active element of the DMR is a flexible silicone bulb which inflates and deflates in response to the static pressure difference across the control. The housing is made of polycarbonate (Lexan) or polyvinyl chloride (Lucorex), for minimum flame spread characteristics.
The DMR is made for use in a temperature range of -10 to +60°C. Constant Airflow Dampers maintain airflow accurately to within 10% of rated flow (15% for units 125 M^3/h or less). See "How the DMR Works" for conditions. The DMR's sub-assembly, consisting of the silicone bulb and its housing, is mounted in a galvanized steel sleeve. The total assembly is designed to fit inside standard rigid round ducting, as well as duct fittings such as tees, etc. A brush type seal around the circumference ensures a tight fit. A set of spring action metal clips grip the interior of the duct or fitting to secure the control firmly in place with minimum installation effort.

Article code: DMR{Ø}/{Q}



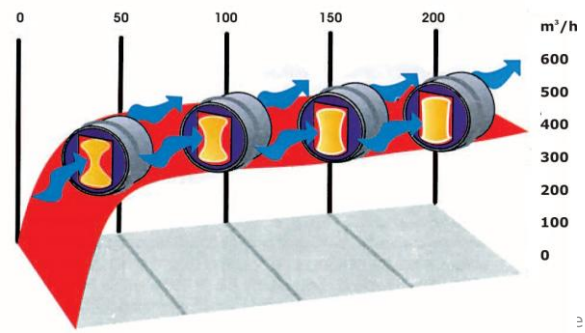
The expected lifetime of the silicone bulb is a minimum of 20 years under normal non-corrosive conditions.

HOW THE DAMPER WORKS

Constant airflow is achieved by the inflating action of DMR's silicone bulb.
At minimun static air pressure, the bulb is deflated and has the shape similar to an hourglass. As the static pressure increases across the bulb it inflates, thereby reducing the free area around the bulb. At the same time the higher static pressure increases the air velocity resulting in CONSTANT AIRFLOW regardless of pressure differences in the range of 50 to 200 Pa (Low Pressure).

- Airflows are rounded to the nearest 5 m3/h.
- The sizes are nominal.
- The DMR is designed to be inserted into a duct of the indicated diameter.
- Airflows are factory preset and cannot be modified by the installer.

LOW PRESSURE
Pressure difference



The curve illustrates the simultaneous action of a decreasing orifice area and increasing velocity resulting from increasing pressure to maintain constant airflow:
Area (m^2) x velocity (m/h) = Q (m^3/h)

Diameter	Q = M^3/H
80	**15-30-45-60**
100	**15-20-25-30-35-40-45-50-55-60-75-85-90**
125	**75-80-85-90-95-100-105-110-120-130-150-160-190**
150	**110-130-150-170-210-250**
160	**120-130-140-150-160-170-180-190-200-210-250**
200	**200-225-250-275-300-325-350-400**
250	**300-350-400-450-500-550-650**

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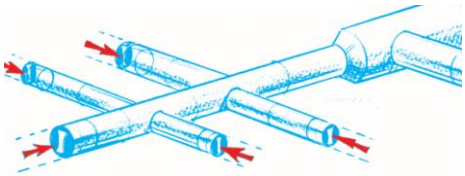
3.240 DMR - CONSTANT VOLUME DAMPER

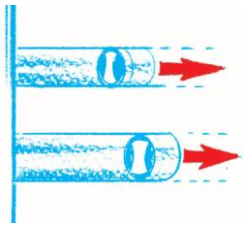
Air Management

MAINTENANCE
The **DMR** needs no maintenance when used in normal conditions. There is no risk of dust deposit or obstruction because the **DMR** has no airways subject to clogging. If the intended application includes air heavily loaded with grease or dust, a fitting with an access panel or door, such as that used for flame dampers, must be provided.

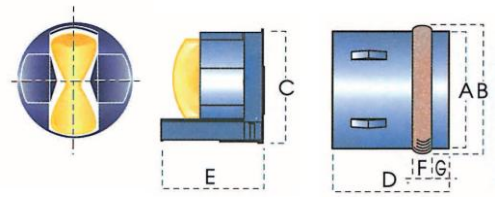
WARRANTY
Guaranteed for 5 years, from date of shipment, against all defects in material or workmanship, provided that the material has been installed and utilized under normal conditions. This warranty is limited to the repair or replacement of the material upon its return freight paid to our factory.
The DMR is a patented product. We reserve the right to change specifications without notice.



Exhaust Application



Supply Application



Remark:
The DMR must be placed on 4x Dn in distance to a corner or a ductbranch. This in regards to the laminaire airflow.

DIMENSIONS

Duct Diam.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (Kg)
080 mm	76	82	76	72	79	15	12	0.15
100 mm	98	104	96	80	60	13	10	0.19
125 mm	121	128	119	137	95	13	20	0.40
150 mm	146	156	142	137	105	20	20	0.55
160 mm	156	166	152	137	105	20	20	0.55
200 mm	196	206	192	155	125	20	20	0.92
250 mm	247	256	234	172	158	20	19	1.70

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3.240 DMR - CONSTANT VOLUME DAMPER

Air Management

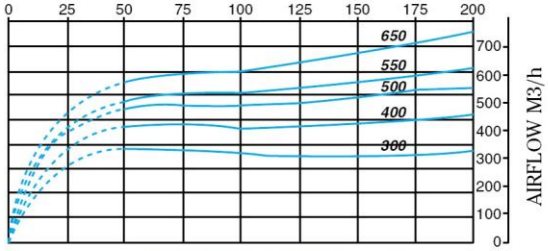
AIRFLOW PERFORMANCE DATA

LOW PRESSURE RANGE

(Balancing Airflows in the Range of 50 to 200 Pascals)

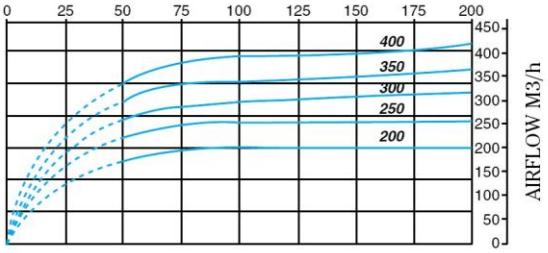
10" DIA (250 mm)

PRESSURE DIFFERENCE (PASCALS)



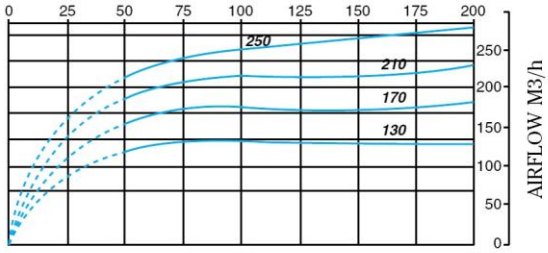
8" DIA (200 mm)

PRESSURE DIFFERENCE (PASCALS)



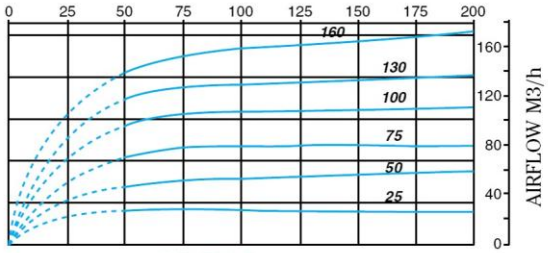
6" DIA (150 mm)

PRESSURE DIFFERENCE (PASCALS)



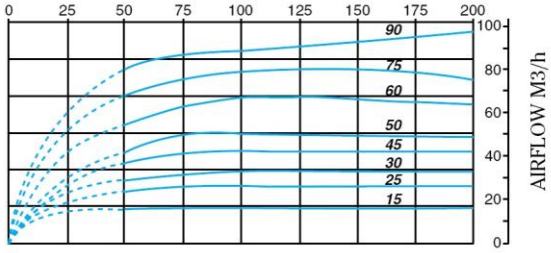
5" DIA (125 mm)

PRESSURE DIFFERENCE (PASCALS)



4" DIA (100 mm)

PRESSURE DIFFERENCE (PASCALS)

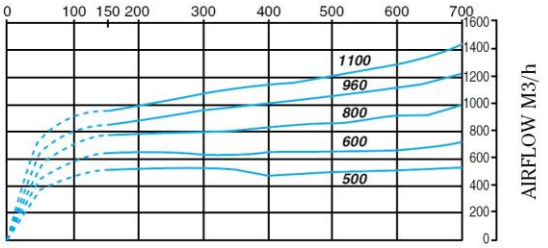


HIGH PRESSURE RANGE

(Balancing Airflows in the Range of 150 to 600 Pascals)

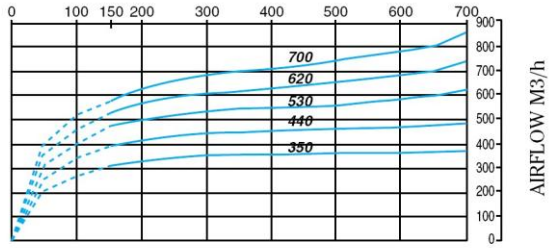
10" DIA (250 mm)

PRESSURE DIFFERENCE (PASCALS)



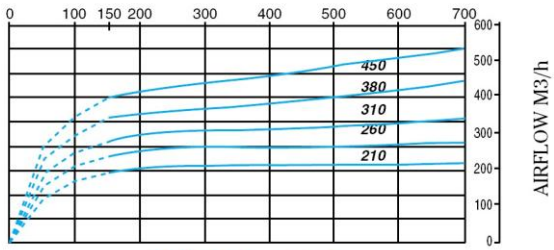
8" DIA (200 mm)

PRESSURE DIFFERENCE (PASCALS)



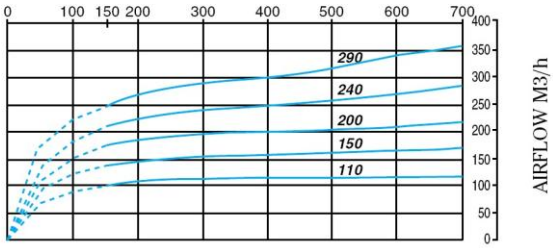
6" DIA (150 mm)

PRESSURE DIFFERENCE (PASCALS)



5" DIA (125 mm)

PRESSURE DIFFERENCE (PASCALS)



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3.250 D5G/D5 EXTERNAL LOUVRES

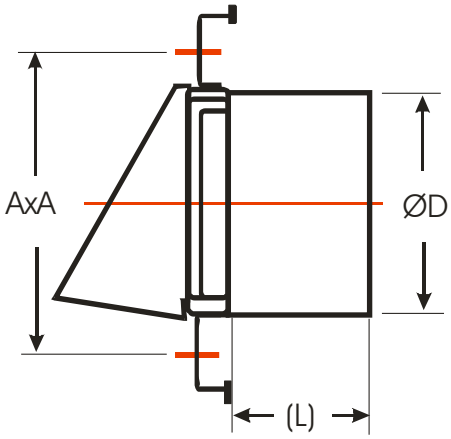
Air Management

External louvres are used as covering grilles in air exhaust openings.

CONSTRUCTION

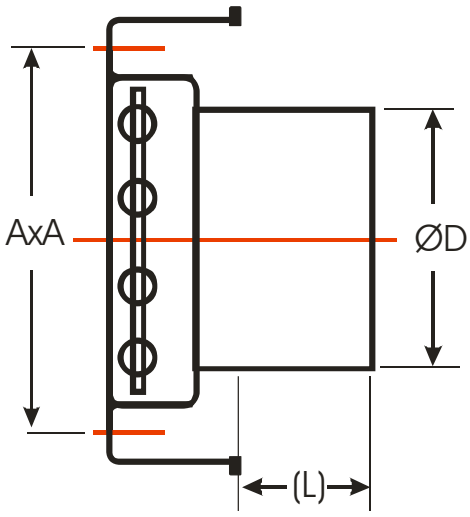
The **D5G** has a beautiful design with a slanted front grille hood for exhaust air, the deflection shutter helps to control back-drafts and resist water from entering. The shutter is opened in case of overpressure. Made of durable stainless steel 304/2B.

Code	L (mm)	ØD (mm)	A x A (mm)	Thickness (mm)	Weight (gr)
D5G100	52	97	137 x 137	0.31 - 0.6	360
D5G125	52	120	167 x 167	0.4 - 0.6	440
D5G150	62	145	167 x 167	0.4 - 0.6	500



The **D5** with moveable vanes are extremely solid and made of high quality 304/2B stainless steel.
The movable vanes are opened in case of overpressure and help control back-drafts and resist water from entering.

Code	L (mm)	ØD (mm)	A x A (mm)	Thickness (mm)	Weight (gr)
D5100100	52	97	137 x 137	0.5 - 0.6	300
D5125125	52	120	167 x 167	0.5 - 0.6	470
D5150150	62	145	167 x 167	0.5 - 0.6	500



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3.260 DTQA Supply air diffuser

Air Management

DTQA is a very quiet supply air diffuser which is suitable for air distribution in offices, houses and rooms where wall mounting is required. It can be mounted on wall and also close to the ceiling. **DTQA** has a removable front plate for easy cleaning, measuring and adjustment of air flow.

Product facts

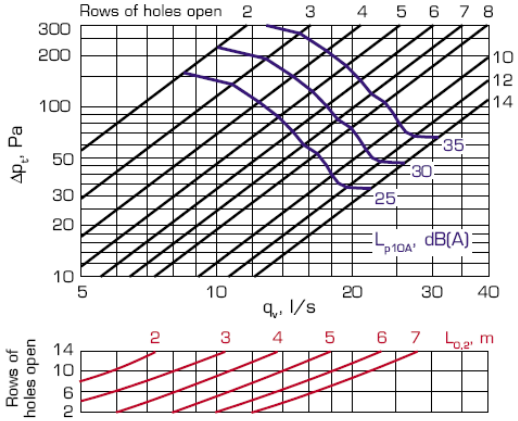
- Low noise level
- Can be mounted close to the ceiling
- Removable front plate for easy cleaning, measuring and adjustment of air flow

Quick selection when 8 open rows

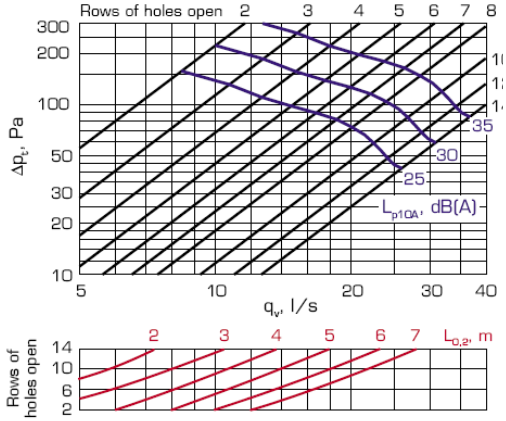
Diffuser	Connection	Air flow l/s (m3/h) and noise level		
Size	mm	25 dB(A)	30 dB(A)	35 dB(A)
DTQA100	100	17	20(72)	24
DTQA125	125	20	24(86)	28

Air flow, pressure drop, sound level, throw

DTQA-100



DTQA-125



Sound power level L_W

STQA	CORRECTION K_{oct} (dB) Middle frequency by octave band (Hz)						
	125	250	500	1000	2000	4000	8000
100	-1	-4	0	0	-2	-11	-14
125	2	-3	-2	-1	-1	-8	-13
Toler.±	3	2	2	2	2	2	3

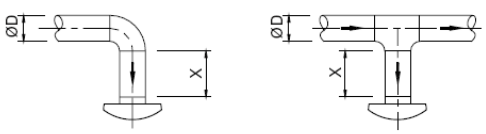
Sound attenuation ΔL

STQA	Rows of holes open	SOUND ATTENUATION ΔL (dB) Middle frequency by octave band (Hz)							
		63	125	250	500	1000	2000	4000	8000
100	14	19	13	8	0	0	1	3	3
	8	19	13	7	0	0	4	5	5
	2	19	14	7	7	10	7	9	12
125	14	17	12	6	0	0	1	2	3
	8	17	12	6	1	2	4	5	5
	2	19	14	8	8	10	7	10	11
Toler.±		6	3	2	2	2	2	2	3

Effect of distance X and open rows of holes to the noise level at different connections

Ø100	Rows of holes open					
	14		8		2	
X						
4D	+0 dB	+2 dB	+0 dB	+2 dB	+0 dB	+0 dB
2D	+3 dB	+4 dB	+2 dB	+4 dB	+0 dB	+0 dB
0D	+4 dB	+6 dB	+3 dB	+5 dB	+0 dB	+0 dB

Ø125	Rows of holes open					
	14		8		2	
X						
4D	+0 dB	+0 dB	+0 dB	+0 dB	+0 dB	+0 dB
2D	+2 dB	+3 dB	+2 dB	+3 dB	+0 dB	+0 dB
0D	+3 dB	+4 dB	+3 dB	+4 dB	+0 dB	+0 dB



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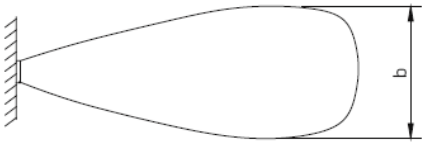
3.260 DTQA Supply air diffuser

Air Management

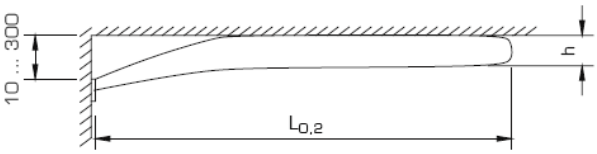
Diffusion pattern, dimensions, installation

Diffusion pattern

From top



From side

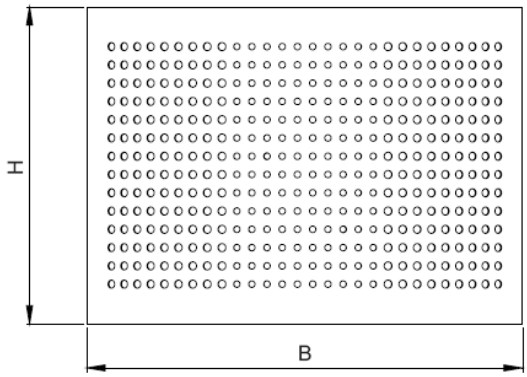


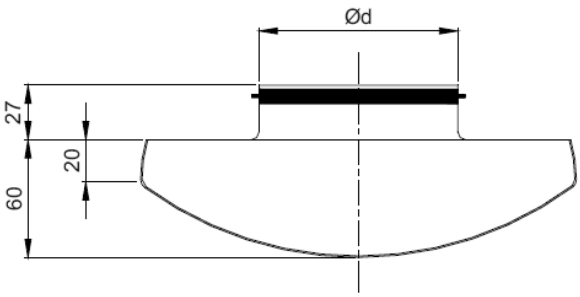
Trow when chilled air is obtained by correction factor k according to the following formula:

$L_{0,2(\Delta t)} = k \times L_{0,2}$

Δt (°C)	b	h	k
0	0,6xL0,2	0,07xL0,2	1,0
-7	0,8xL0,2	0,15xL0,2	0,7

Dimensions and weight





Size	ød	B x H	Weight kg
100	98	218x156	0,66
125	123	218x156	0,65

Installation
DTQA is mounted straight to the duct without mounting ring. Fastening is secured with screws to the wall or with pop rivets to the duct. Front plate is fastened to the body with spring clips.

Measuring and adjustment of the air flow
Air flow measurement is made by measuring the pres-sure difference from the front plate hole. Adjustment of the air volume is obtained by opening and closing the rows of front plate holes.

Application and function, material

Application and function
DTQA is a very quiet supply air diffuser which can be mounted on wall and also close to the ceiling. It is suit-able for air distribution in offices, houses and rooms where wall mounting is required. DTQA has a removable front plate for easy cleaning, measuring and adjustment of air flow. The body of DTQA is equipped with circular rubber sealing gasket joint.

Material and surface finish
The diffuser is made of hot-dip galvanized steel sheet, SS 1151, and meets the requirements for corrosivity class C2 in accordance with SS-EN ISO 12944-2.
The diffusers are powder-coated, which gives a high surface finish and good impact and scratch resistance. Standard colour is white RAL 9010, gloss 70. Other colours are available to special order.
Also available in stainless steel shiny 1.4301 (DTQAY)

Instructions
Instructions for installation, adjustment and maintenance are described in detail in our technical instructions, which are supplied with every product.

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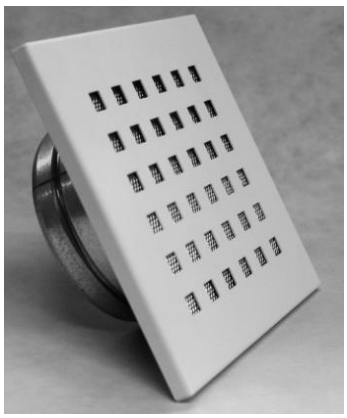
3.261 DQD-P Supply air diffuser

Air Management

Application and function
DQD-P is a very quiet supply air diffuser which is suitable for air distribution in offices, houses and rooms where wall mounting is required. It can be mounted on wall and also close to the ceiling.
The **DQD-P** has a removable front plate for easy cleaning, measuring and adjustment of air flow.
The body is equipped with circular rubber sealing gasket joint.



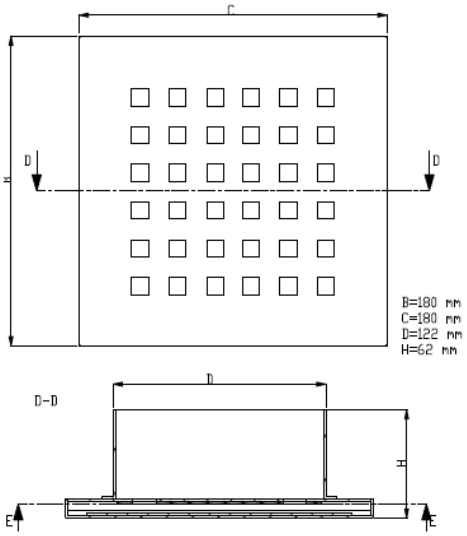
Product facts
- Low noise level
- Can be mounted close to the ceiling
- Removable front plate for easy cleaning, measuring and adjustment of air flow

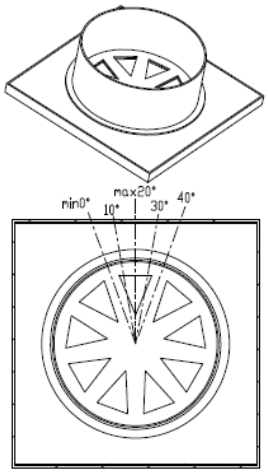
Installation
DQD-P is mounted straight to the duct without mounting ring. Fastening is secured with screws to the wall or with pop rivets to the duct. Front plate is fastened to the body with spring clips.

Measuring and adjustment of the air flow
Air flow measurement is made by measuring the pres-sure difference from the front plate hole. Adjustment of the air volume is obtained by opening and closing the rows of front plate holes.

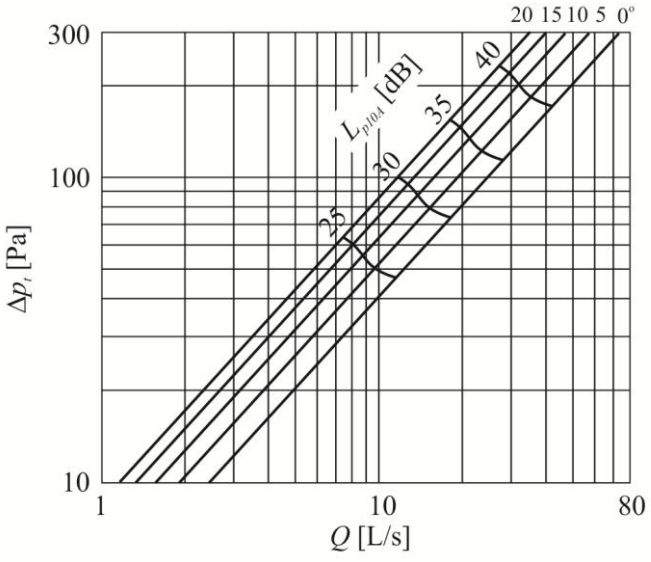
Material and surface finish
The diffusers are powder-coated, which gives a high surface finish and good impact and scratch resistance. Standard colour is white RAL 9010, gloss 70. Other colours are available to special order.

The valve is totally opened when the angle of the valve actuating element is 0° or 40°. Minimum openness appears when the angle of the valve actuating element is 20°. This valve type was tested together with filter that is an integral part of the valve.





The Fig. graphically shows the dependence of flow rate, noise intensity and total pressure drop across the valve type DQD - P125



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3.270 DTVB Supply air valve

Air Management

The **DTVB** is a supply air valve for ceiling mounting in offices, houses and hotel rooms.
The air discharged from the valve is mixed thoroughly with the room air thus providing a draught-free air supply.

Product facts

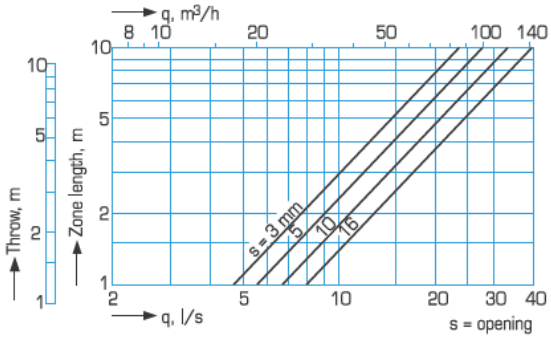
- Supply air valve intended for installation in the ceiling
- Manufactured of steel

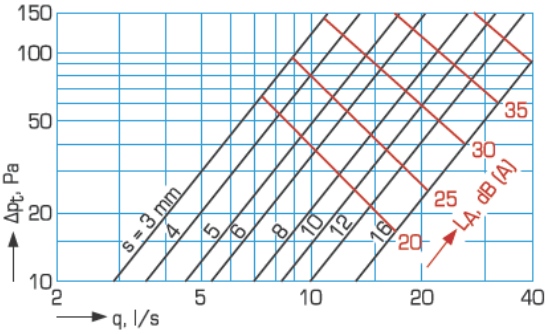
Quick selection

Diffuser	Connection	Air flow range l/s (m3/h) at noise level		
Size	mm	25 dB	30 dB	35 dB
DTVB100	100	21	27 (97)	32
DTVB125	125	28	33 (119)	42
DTVB160	160	42	51 (184)	61

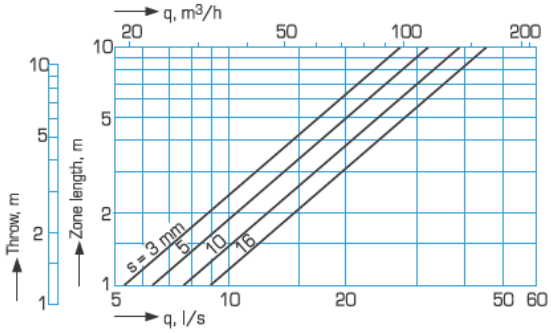
Air flow, zone length, throw, sound level

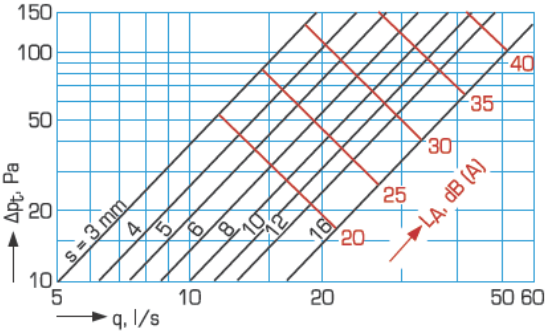
DTVB100



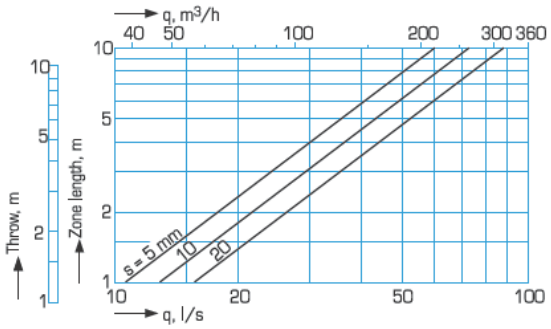


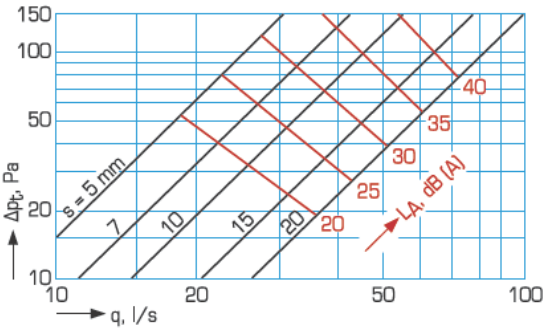
DTVB125





DTVB160





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3.270 DTVB Supply air valve

Sound power level

Size	Connection	Correction of sound attenuation (dB) at Hz							
		63	125	250	500	1000	2000	4000	8000
100	Straight	2	-3	-3	0	-1	-1	-9	-16
100	Angle	4	-2	-3	-1	-1	-1	-7	-14
125	Straight	3	2	1	1	0	-3	-9	-12
160	Straight	5	6	2	2	0	-5	-10	-5

Sound power levels by octave bands are obtained by adding to total sound pressure level Lp10A, dB(A) the corrections Koct presented in the table according to the following formula:

$$L_W = L_{A10} + K_{ok}$$

Correction Koct is average value in range of use of DTVB unit.

Air stream diffusion

	1-way
$b_v = l_{0,2}$ x	0,1
$bh = l_{0,2}$ x	1,0

where I0,2 = 1,2 x zone length

Note! In installations when DTVB is mounted with with angle duct DGEZ-43 the sound power level will increase by 3 dB(A).

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3.270 DTVB Supply air valve

Sound attenuation, dimensions and weights

Sound attenuation

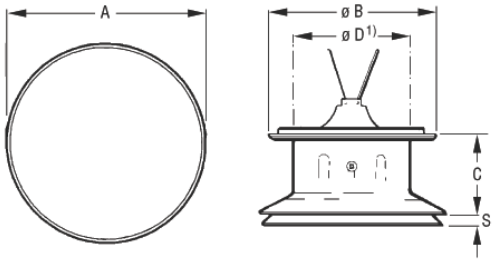
Size	Connection	Sound attenuation in dB at							
		63	125	250	500	1000	2000	4000	8000
100	Straight	25	22	17	13	12	11	11	11
100	Angle	27	23	18	14	12	11	11	12
125	Straight	25	20	15	12	11	9	9	9
160	Straight	26	17	13	12	11	7	7	8

The average sound attenuation ΔL from duct to room including the end reflection of the connecting duct in ceiling installation, is obtained in the table above.

Dimensions and weights

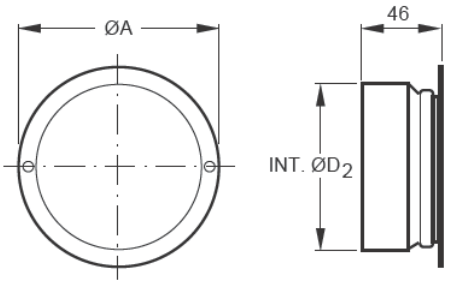
Size	A	B	C	D 1)	Smin	Smax	Weight
	mm	mm	mm	mm	mm	Mm	kg
100	155	140	65	100	3	16	0,45
125	185	165	70	125	3	16	0,58
160	226	200	78	160	3	20	0,93

1) Nominal connection diameter



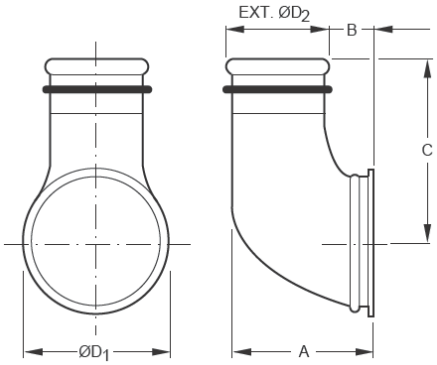
Mounting ring KGEZ-05, fit-on connection

Size	A	D2	Hole 1)	Weight
	mm	mm	mm	kg
100	125	100	110	0,1
125	150	125	135	0,1
160	185	160	170	0,16



Angle duct KGEZ-43

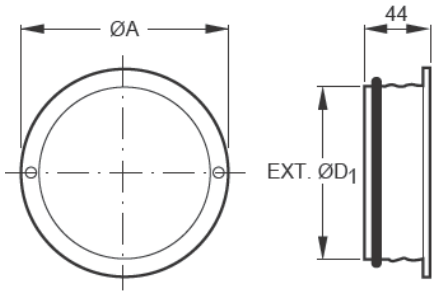
Size	A	B	C	D1	D2	Weight
	mm	mm	mm	mm	mm	kg
100-080	120	39	148	125	79.3	0.4
100-100	140	39	98	125	99.3	0.4
120-100	146	45	120	140	99.3	0.5



Mountin ring KGEZ-01, insertion connection

Size	A	D1	Hole1)	Weight
	mm	mm	mm	kg
100	125	99.3	110	0.1
125	150	124.3	135	0.1
160	185	159.3	170	0.16

1) Tolerance ± 5 mm



Packaging

The ceiling valve is delivered as standard in a cardboard box as follows:

Size	Quantity	Weight kg	Volume M3
100	20	9	0.04
125	20	13	0.08
160	20	20	0.14

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3.270 DTVB Supply air valve

Installation, adjustment, application and function, material

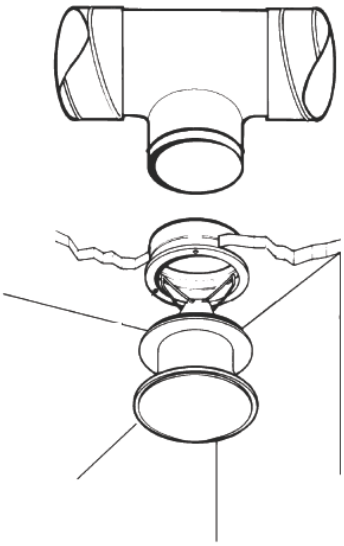
Application and function
The DTVB is a supply air valve for one-way air diffusion and ceiling mounting. The valve is suitable for use in small premises, such as offices, houses and hotel rooms. The air discharged from the valve is mixed thoroughly with the room air thus providing a draught-free air supply. The direction of air diffusion and the air flow are adjustable.

The design of the DTVB minimizes the risk of dust deposits forming on the ceiling surface. The valve is easy to install and easy to keep clean since it has large, smooth surfaces.

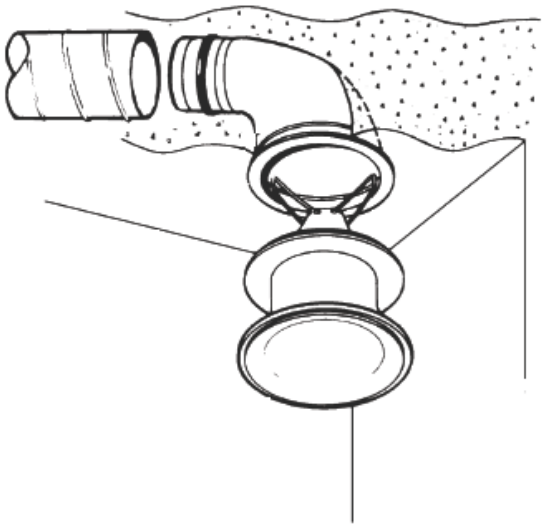
Material and surface finish
The valve is made from hot-dip galvanized steel sheet.
Visible parts are powder-coated for a high surface finish and good impact and scratch resistance.
Standard colour White RAL 9010. Other colours on request.

Instructions
Directions for installation, adjustment and care are set out in detail in our technical instruction which accompanies each product.

Installation
Supply air valve connected to a mounting ring

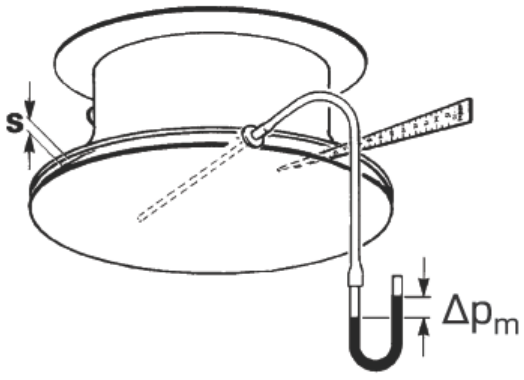


Supply air valve connected to an angle duct



Adjustment

s	k		
	100	**125**	**160**
3	0.9	-	-
4	1.2	2.0	-
5	1.4	2.3	2.6
6	1.7	2.6	3.1
7	1.9	3.0	3.5
8	2.1	3.3	3.9
10	2.6	4.0	4.6
12	3.1	4.7	5.4
16	4.1	6.0	6.9
20	-	-	8.3



$$q = k\sqrt{\Delta p_m}$$
(l/s) (Pa)

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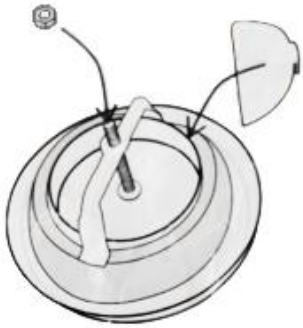
3.280 DTS Supply air valve

Air Management

DTS valve is a supply air valve for ceiling mounting in offices, houses etc.

Product facts

- Equipped with a sector plate for direction of the air flow
- Equipped with a nut to fixate the disk
- Manufactured of steel



The sector plate as well as the nut is separately packed.
This needs to be assembled with the valve. Please view the assembling instructions.

Quick selection

Size		Air flow l/s (m3/h) at sound level		
		25dB	30dB	35dB
DTS100	With sector plarte	15	22 (79)	-
DTS100	Without sector plate	19	29 (104)	-
DTS125	With sector plarte	20	28 (101)	-
DTS125	Without sector plate	25	42 (151)	-
DTS160	With sector plarte	20	42(151)	-
DTS160	Without sector plate	40	66 (238)	-

Construction
The body is equipped with cellular plastic gasket to form an airtight seal with the mounting ring.
The valve is equipped with a sector plate for direction of the air flow. Adjustment of the valve or sector plate is achieved by simply rotating the disc and/or sector plate to the desired setting and secured by means of a single lock nut.
The DTS is manufactured from sheet steel and stove enamelled in white. Other colours are available to special order. Mounting rings KKL and KKT are manufactured from galvanized steel sheet. KKT is equipped with rubber sealing gasket.

Installation
Mounting ring KKL or KKT is fitted into the duct with screws or rivets. The valve is fitted into the mounting ring by a "screwing action" to locate lugs into indents in the mounting ring. The valve can also be fitted with springs (model DTS-J) and the mounting ring is not needed.

Measurement and regulation of air flow
The measurement of air flow is made by a pressure difference measurement with a separate measuring tube. Air flow can be adjusted by changing the adjustments by rotating the disc.

Accessories
In order to protect the ceiling an extra protection plate SL and extension collar KR are available, both made of sheet steel and stove enamelled white. The protection plate is fitted between the air valve and the ceiling

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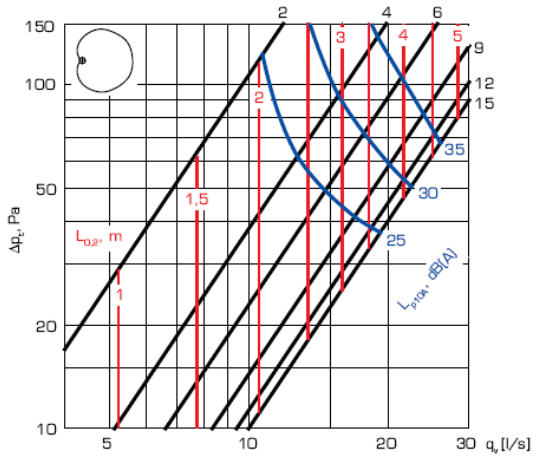
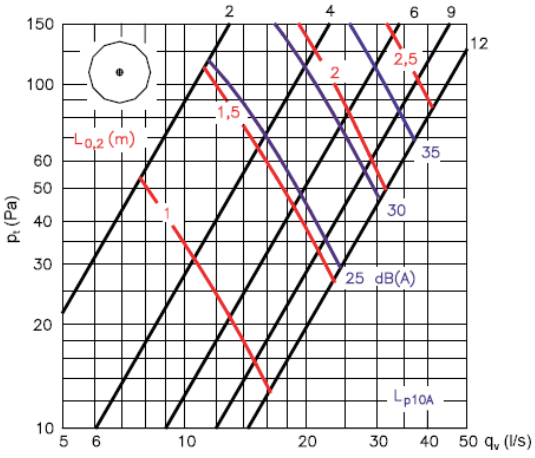
3.280 DTS Supply air valve

Selection diagrams

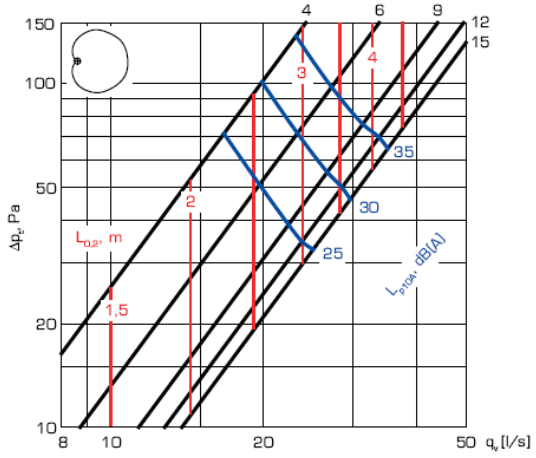
DTS-100 with sector plate



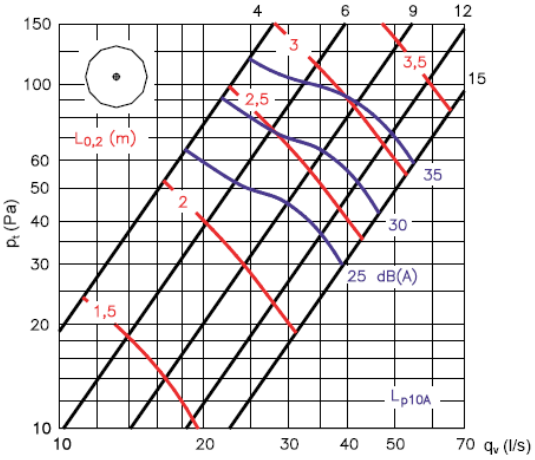
DTS-100 without sector plate



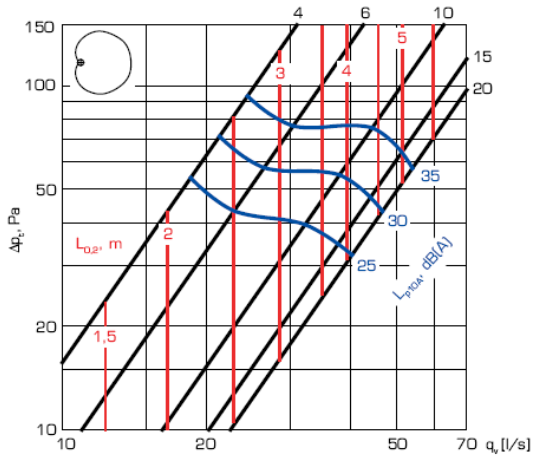
DTS-125 with sector plate



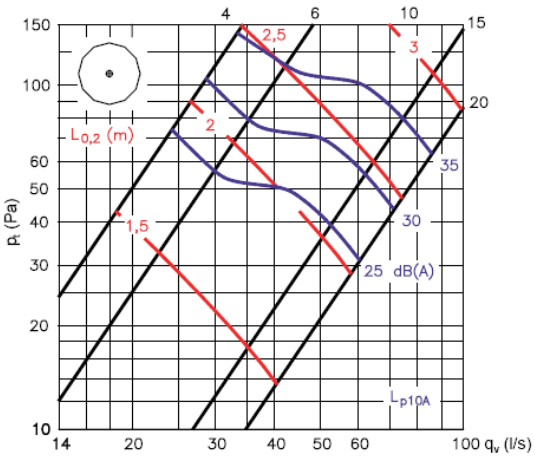
DTS-125 without sector plate



DTS-160 with sector plate



DTS-160 without sector plate



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3.280 DTS Supply air valve

Acoustical data, dimensions and weight

Sound power level L_W

DTS with sector plate

DTS	Correction of sound level in dB at octave bands, middle frequency, Hz						
	125	250	500	1000	2000	4000	8000
100	2	2	0	-2	-4	-4	-12
125	3	3	3	0	-8	-15	-29
160	7	4	2	-1	-6	-17	-31
Tol. ±	3	2	2	2	2	2	3

DTS without sector plate

DTS	Correction of sound level in dB at octave bands, middle frequency, Hz						
	125	250	500	1000	2000	4000	8000
100	-2	2	1	-1	-4	-5	-11
125	4	5	3	-1	-11	-17	-29
160	7	6	3	-2	-11	-19	-32
Tol.±	3	2	2	2	2	2	3

Sound power levels by octave bands are obtained by adding to total sound pressure level L_{p10A}, dB(A), the corrections K_{oct} presented in the table according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct}$$

Correction K_{oct} is average value in range of use of the unit.

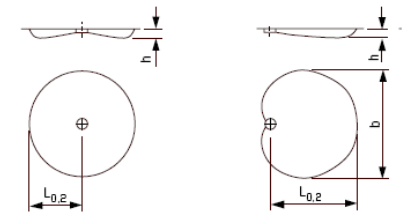
Sound attenuation ΔL

DTS	Correction of sound level in dB at							
	63	125	250	500	1000	2000	4000	8000 Hz
100	22	18	13	11	9	8	7	8
125	20	16	11	9	9	7	6	5
160	18	14	10	9	9	7	6	6
Tol.±	6	3	2	2	2	2	2	3

The average sound attenuation ΔL from duct to room including the orifice attenuation of the connecting duct in ceiling installation, is obtained in the table above.

Diffusion pattern

DTS without sector plate | DTS with sector plate



$L_{0.2(\Delta t)} = k \times L_{0.2}$

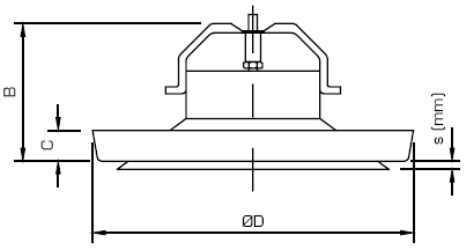
Regulation	Δt (C°)	b	h	k
s = 4	0	1.45 x $L_{0.2}$	0.04x $L_{0.2}$	1.0
s = 4	-10	1.45 x $L_{0.2(\Delta t)}$	0.08 x $L_{0.2(\Delta t)}$	0.8
s = 15	0	1.45 x $L_{0.2}$	0.04 x $L_{0.2}$	1.0
s = 15	-10	1.45 x $L_{0.2(\Delta t)}$	0.1 x $L_{0.2(\Delta t)}$	0.75

Throw in free space mounting

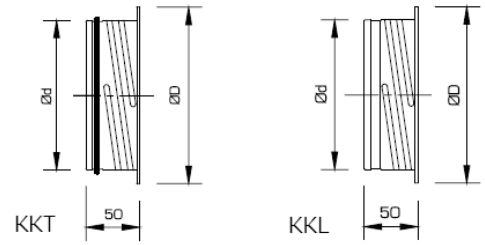
In case of free space mounting the throw can be calculated by using the following factors: when Δt = 0°C:

Adjustment s (mm)	factor
4	0.5
9	0.45
15	0.4

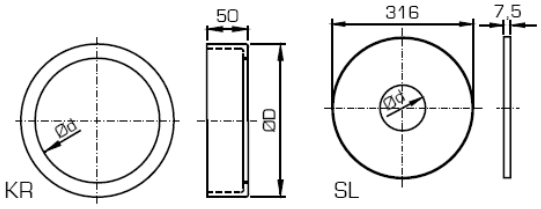
Dimensions and weight



Size	ØD	Ød	B	Weight g
100	143	67	17	270
125	173	76	18	430
160	216	80	19	580



Size	Ød	ØD	Weight KKT (g)	Weight KKL (g)
100	99	122	75	71
125	124	148	102	97
160	159	184	131	125



Size	ØD	Ød
100	150	100
125	180	125
160	223	160

Size	ØD
100	102
125	130
160	160

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4.0 GENERAL MOUNTING INSTRUCTIONS

Introduction.
For installing and using several DEC products optimally some items have to be considered.
In this chapter general and specific instructions for all relevant products will be described:

4A flexible ducts (general)
4B flexible ducts with insulation (specific)

GENERAL MOUNTING INSTRUCTIONS FLEXIBLE DUCTS.

To mount flexible ducts correctly, the next items should be considered. The items will be explained shortly and the drawings will illustrate how to mount the duct.

4A.1 mounting instructions (general)
4A.2 shortening of ducts
4A.3 making connections
4A.4 suspension points
4A.5 bending radius
4A.6 support
4A.7 connection to ducts and armatures
4A.8 static electricity
4A.9 situations in practice

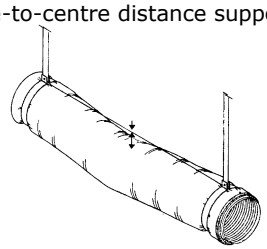
4A.1 Mounting instructions (general).
- The duct has to be stretched completely. A duct that has not been stretched completely causes a lot of pressure loss.
- Do not use more of the duct than necessary.
- Use about 1 - 1.5m of the duct for each connection piece. If more length will be needed (e.g. for acoustic ducts) the duct has to be fastened correctly with saddle brackets (see 4A.5 and 4A.7).
- During mounting take care that the duct will not be damaged (e.g. a co-ordination with respect to light armatures and ceiling constructions).
- Replace damaged ducts by new ones. Replace also damaged outer jackets of insulated ducts (in connection with loss of air and density of steam).

4A.2 Shortening of ducts.
- The duct has to be stretched completely
- Measure the correct length and mark it with a felt marker
- Cut the duct into two pieces over the entire diameter right in a winding.
- Cut the spiral

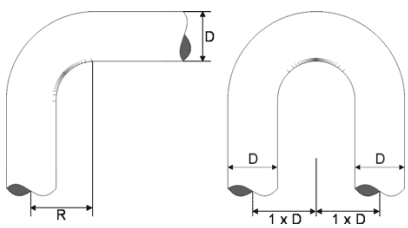
4A.3 Making a connection
- Shorten the duct correctly.
- Push the duct 50mm beyond the connection piece.
- Seal the connection airtight with **DEC aluminium tape**.
  (For Marine use we recommend to use always an ASB tape)
- Fix the sealed duct with a nylon or metal clamp. (*For Marine use we recommend to use always metal clamps)*

4A.4 Suspension points
The maximal sagging of the duct, between two fastening points, should not exceed 50 mm/m (see fig 4.1)
The distance between two suspension points varies from 1.5 up to 3m depending of the duct type.
A flexible duct above a ceiling construction needs a 1m centre-to-centre distance support

Fig. 4.1
Max. Sagging 50 mm/m



4A.5 Bending radius
The minimal bending radius of each product has been described on the product information page. The bending should be as large as possible. A minimal bending radius provides a greater pressure loss. The bending should be twice the diameter for minimizing the effect of a bend



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4.0 GENERAL MOUNTING INSTRUCTIONS

4A.6 SUPPORT

A duct is, generally, very flexible and can be transformed easily. In case of transformation the inner diameter will decrease and the pressure loss will increase. Much attention should be paid to fastening the ducts, in case of using clips.
Use the correct clip diameter and make sure that the clips support the duct half of the diameter minimally (see fig. 4.2).

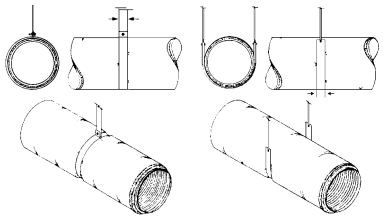
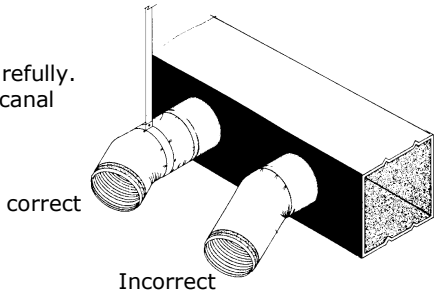


Fig. 4.2

4A.7 Connections to canals and armatures

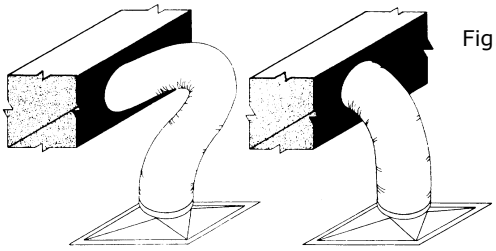
The connection of flexible ducts to canals and armatures should be performed very carefully. Because many ducts have been mounted with a bend, right after the connection to a canal or armature, a supporting clip will be needed.

Fig. 4.3 The right connection is too "sharp"



Metal ducts can produce a crack if the canal connections are too "sharp" (fig. 4.3)
If the duct has to be connected to light- or air armatures the connection should be as "direct" as possible. The instructions should be consulted. Too many bends close to an armature will cause increasing of pressure loss. It will also cause unnecessary noise. Fig. 4.4 shows an "incorrect" armature connection. Fig. 4.5 shows a "correct" connection.

Fig. 4.4



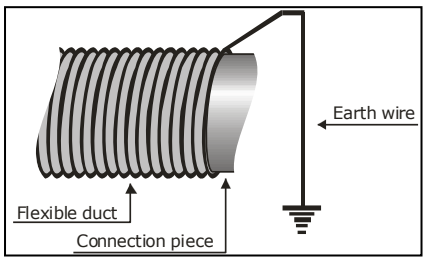
incorrect

Fig. 4.5

correct

4A.8 Static electricity

Building up and discharging electricity can cause explosion risk. This could happen if air, with organic solvents, flows through a synthetic or a laminate duct with high speed. Making a connection between the spiral wire of the duct and an earth wire can minimize building up static electricity. For machine exhausting a connection can be made between the metal wire of the duct and the casing of the machine. The earthen of the machine and the connection between machine and duct, however, has to be controlled frequently. Especially if the exhaust system is in motion or the machine causes vibrations.



4A.9 Situations in practice

During mounting there are often situations where a longer flexible duct is recommended. An example is the bridging between the differences in height where no standard connection pieces can be used.
Take care that there is no contact between the duct and other existing components with a high temperature.
A duct provided with a PVC layer will quickly fall apart, if it is in contact with the tube of the central heating for a while.
Even a central heating tube can increase the ageing process of such a duct.
The lifespan of ducts can rather be shortened if ducts with different metals (also from other ducts) will be in contact intensively. Rooms, which are warm and damp, could cause a quicker corrosion.

Fig 4.6

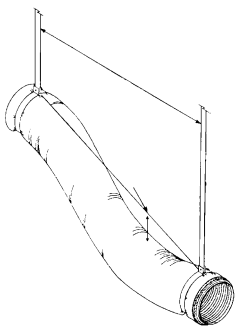
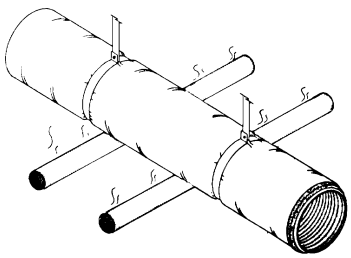


Fig 4.7



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4.0 GENERAL MOUNTING INSTRUCTIONS

Flexible insulated ducts
For insulated flexible ducts there are more points to consider. These points are mainly concentrated on the processing of the duct. For various applications a difference has been made between thermally and acoustically insulated ducts.

4B.1 thermally insulated

DEC's product series has no ducts, which have already been sealed. But this is possible on request. Ducts which have not been sealed have a maximal output, if the items below have been considered (see fig.4.9)

- Shorten the duct correctly
- Push the duct over the connection piece 50 mm minimally
- Push back the insulation blanket
- Seal the connection piece of the inner duct with DEC aluminium tape (ALUTAPE) at least two windings around the duct
- Take away the insulation blanket
- Attach the outer jacket with ALUTAPE to the inner duct, at least two complete windings around the duct
- Take care that the end piece of the duct has been sealed air-tight
- Attach outer jacket and inner duct together with nylon or metal clamps. (*For Marine use we recommend to use always metal clamps)*

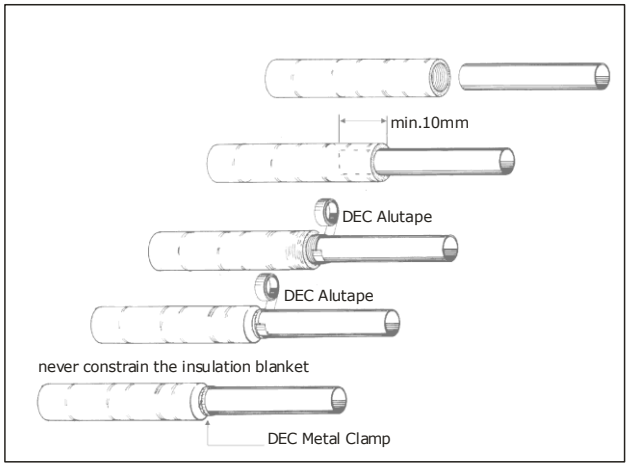

Fig. 4.9

Mistakes in practice
A mistake which has been made often, is the fixing of the insulation blanket with a clamp, without sealing with tape. There is no guarantee that this way of working is effective, because the sealing is not airtight.

4B.2A Acoustically insulated ducts

DEC has two types of ducts within the assortment of this product group: sealed and non-sealed ducts:

- Perforated ducts enveloped by a polyester barrier to prevent that "very small" glass wool particulars penetrate the air system
- Perforated ducts without a polyester barrier

Our acoustic ducts, except Sonodec 25A, have been produced with a polyester barrier.

IMPORTANT
DEC's polyester barrier provides a closed system. That is why the acoustic duct, if installed properly, can be used as a thermal application as well. This is in contrast with many other competing products.

Sealed ducts like **SONODEC® TRD** and **SONODEC® GLX** have already been provided with a sealed end part.
During mounting two items have to be considered:

- The duct has to be pushed around the attachment point for 50 cm minimally. For an optimal sound attenuation push the duct around the attachment point completely

- Fasten the "taped" duct firmly with a clamp

Non-sealed ducts have to be prepared the same way as the thermally insulated ducts (see fig. 4B.1 and 4.9). The polyester barrier, however, should be fastened with a tape together with the micro perforated inner duct. Now follow the same steps, which have been described.

For the **SONODEC® 25** and the **SONODEC® 250** the air-tightness is more important. The micro perforation causes a lot of pressure to the outer jacket. The pressure loss increases and the coefficient of the desired attenuation decreases, because the ducts have not been sealed completely.
A bad sealing can also cause untightness and interfering noises.

Situations in practice

In the **SONODEC® 25** a polyester layer has been inserted, to prevent diffusion of glass fibre particles from the insulation blanket into the system. The barrier has to be attached to the connection piece with **DEC aluminium tape**. When the system is under pressure the barrier could move if it has not been fixed properly.

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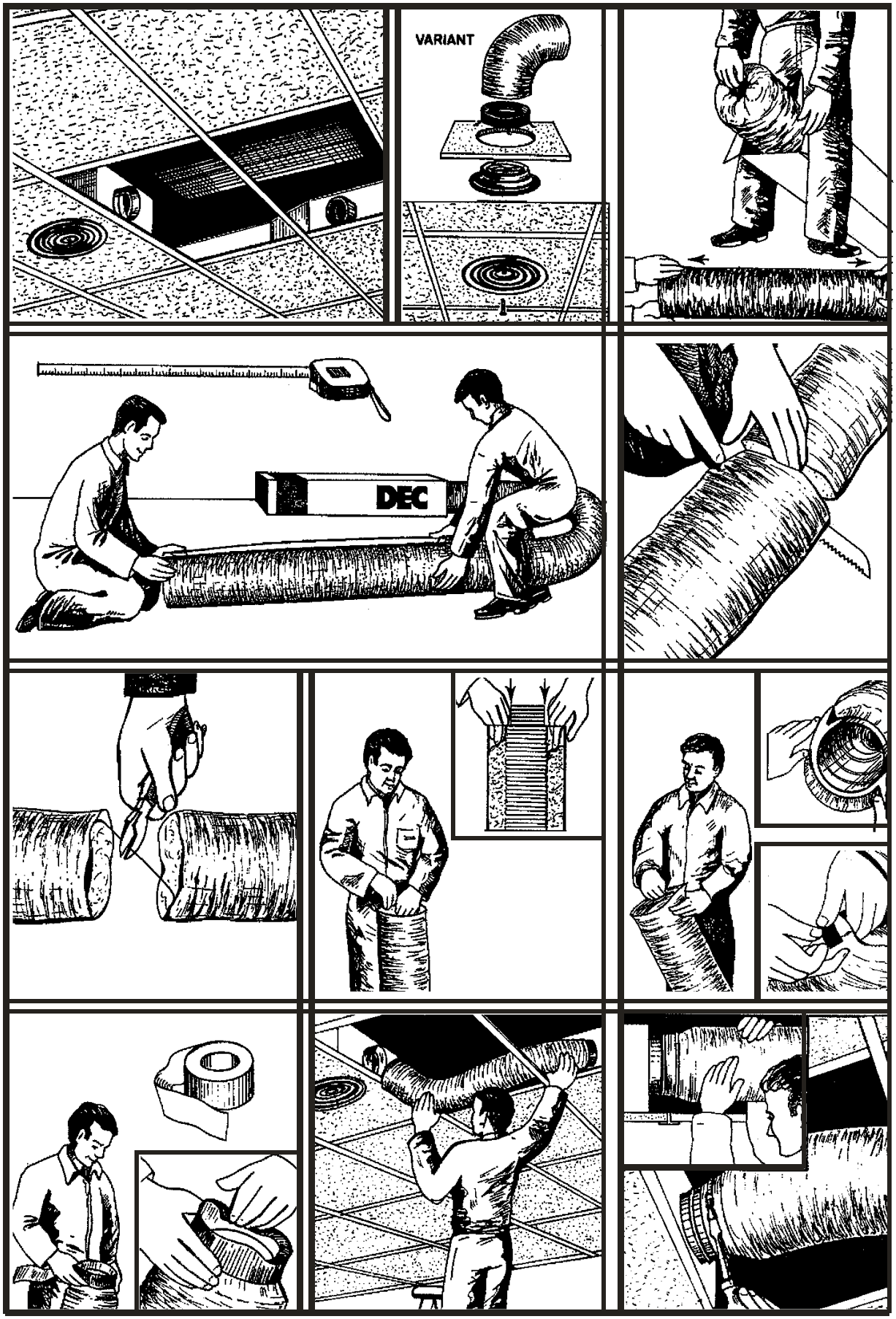
4.1 MOUNTING INSTRUCTIONS Ducts with barrier



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4.2 MOUNTING INSTRUCTIONS

TAPES AND SEALANTS

GOLDEN RULE:

For all of the products of the tapes and sealants group the next golden rule is mainly in force:

THE SURFACE HAS TO BE CLEAN, DRY AND FAT-FREE

On behalf of the fastening products a short review of the points of attention will be given:

Typ	Chapter	Points of attention
ASB	2A	max. adhesion after 24 hours (press firmly)
PSB	2A	max. adhesion after 24 hours (press firmly)
ALU	2A	low percentage of elongation
ALU-R	2A	can be applied at temperatures below zero
PVC	2A	adhesion relative weak
DUCT	2A	adhesion relative weak
GT	2B	high percentage of elongation
SDS	2B	ventilate during processing
WDS	2B	storage/processing frost resistant
FS2000/DEC050	2B	use approx. 2.5 litre of sealant per roll

USERS GUIDE ASB/PSB
THE SURFACE HAS TO BE CLEAN, DRY AND FAT-FREE.
The application temperature must be higher than 5°C. Particularly when the tape is going to be attached at a lower temperature it should be pressed firmly.
Applicate on round(PSB/ASB) or square(ASB) ducts.
A max stretch(PSB) of 3% is allowed and will help the tape to set itself on the duct. If the duct has a diameter >250mm, some clearance between the ducts can be expected due to tolerances; we advice to use only ASB width 75mm or wider.
Use an overlap of 5cm or larger.
Do not use PSB for outdoor applications.

DEC PRODUCTS

1 **SELF ADHESIVE TAPE**

- PSB (polyethylene foil)
- ASB (aluminium foil)

2 **TWO PART SYSTEM**

- DEC-50 (impregnated fabric)
- FS2000 (adhesive/activator)

3 **SEALANTS**

- WDS606 (waterbased mastic)
- SDS400 (solvent based mastic)

CONSTRUCTION

ASB - PSB - ALU TAPE

DUCT TAPE - PVC - GT TAPE

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4.2 MOUNTING INSTRUCTIONS

TAPES AND SEALANTS

SOME CATEGORIES/NAMES:

Aluminium tapes Cloth tapes PVC tapes Polyethylene tapes Foam tapes	backing
Bitumen tapes Butyl tapes Acrylic tapes Silicone tapes	adhesive
Packaging tapes Splicing tapes Electrical tapes First aid & hospital tapes Corrosion tapes Duct sealing tape	application

PSB	=Polyethylene tape	(backing)
	=Duct sealing tape	(application/function)
	=Cold shrinkingtape	(property)
	=(Butyl rubber tape)	(adhesive)
ASB	=Aluminium tape	(backing)
	=Duct sealing tape	(application)
	=Cold shrinking tape	(property)
	=(Butyl rubber tape)	(adhesive)

SPECIFICATION

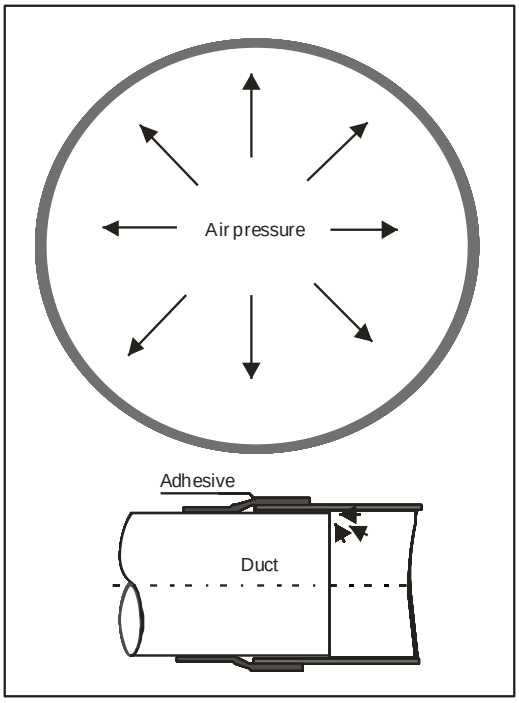
PSB = cold shrinking tape specially made for duct sealing

Backing : light grey polyethylene
Adhesive: hotmelt (PSA)
Liner : silicone treated paper

ASB = tape specially made for duct sealing

Backing : aluminium foil
Adhesive: hotmelt (PSA)
Liner : silicone treated paper

*** ASB and PSB do not have the same adhesive !**



EXPRESSIONS

Adhesion: the strength which connect 2 materials together (tape and substrate)

Cohesion: the mutual connection force betwee parts (molecules) in an adhesive.

Tack : the quick binding capability; It is the property which enables an adhesive to form a bond with a surface of another material upon brief contact under light pressure

Cold flow : material (adhesive) is seeking its lowest level with respect to gravity

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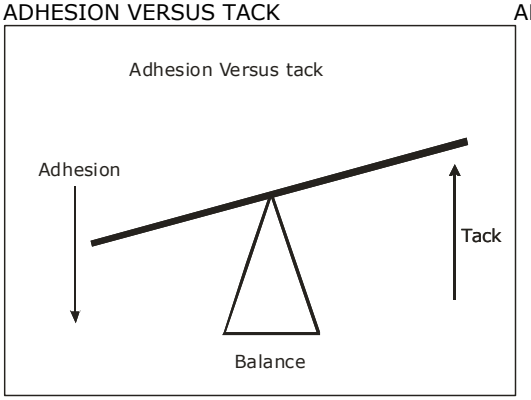
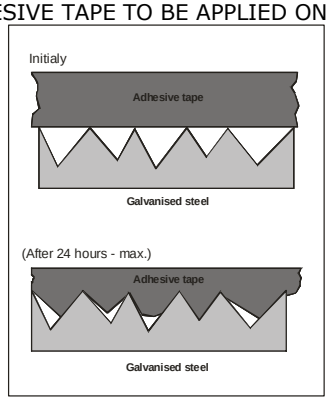
4.2 MOUNTING INSTRUCTIONS

TAPES AND SEALANTS

ADHESION VERSUS TACK



ADHESIVE TAPE TO BE APPLIED ON GALVANISED MATERIAL



ADVANTAGES AND DISADVANTAGES			
PSB		ASB	
ADVANTAGES	DISADVANTAGES	ADVANTAGES	DISADVANTAGES
100 % airtight flexible by stretching more tape aborbs oil saves labour costs DIN 4102 B2	material price not suitable for wet surfaces	100 % air tight absorbs oil high tack/ high adhesion saves labour costs DIN 4102 B2	material price not suitable for wet surfaces cannot be stretched

ADVANTAGES AND DISADVANTAGES TWO PART SYSTEM FS2000/DEC050	
ADVANTAGES	DISADVANTAGES
low in price (material) no duct pre-cleaning (wet or oily surface is no problem) can be applied in low temperatures very high pressure resistance classified DIN 4102 B1	application higher labour costs drying time depends on humidity

The tapes and the system are **non toxic** and contains **no solvents**!!
The **DEC050** contains **no Asbestos** materials!!

ADVANTAGES AND DISADVANTAGES WDS606/SDS400	
WATERBASED SEALANTS (WDS606)	
ADVANTAGES	DISADVANTAGES
not harmful not flammable environmentally friendly can be applied by brush adheres on surfaces with some moisture long shelf life easy cleaning 100 % use	drying time depends on humidity limited for outdoor application
SOLVENT BASED SEALANTS (SDS400)	
ADVANTAGES	DISADVANTAGES
short drying time (fast skinning) application does not depend on weather adheres on slightly oily surfaces not flammable (dry)	harmful inflammable (wet) not environmentally friendly can only be used in well ventilated places limited shelf life

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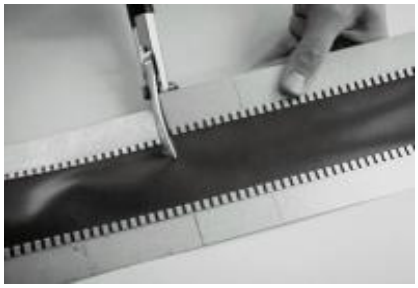
4.3 MOUNTING INSTRUCTIONS DECCONNECTOR

Make sure that the notched side faces outward and provide the positioning of the joint in the middle of a side rather than in a corner.



At a notch, cut a length equivalent to the perimeter increased by 5 to 6 cm.

Lift the seam outwards to a right angle.

Make a cut at the edge of the lifted seam section.

Bend down the seam whilst ensuring that the cloth remains fastened.

Coat the cloth with its appropriate adhesive.

Join both sides.

Press together firmly.

Spotweld the steel.

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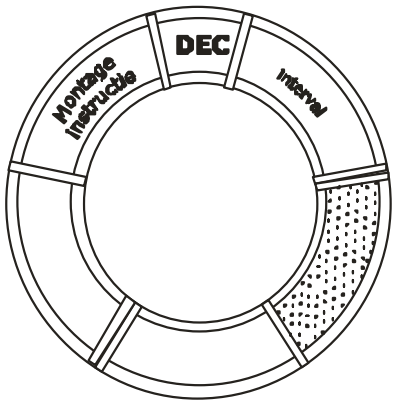
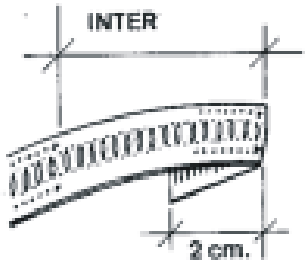
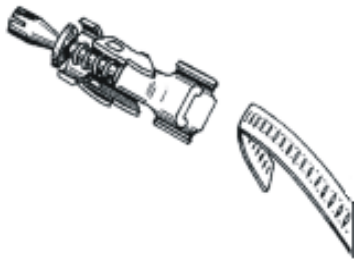
4.4 MOUNTING INSTRUCTIONS MULTIBAND

For fixing the Multiclamp to the Multiband follow the underneath Figures		
		
	FIG 1	FIG 2
		
FIG 3	FIG 4	FIG 5

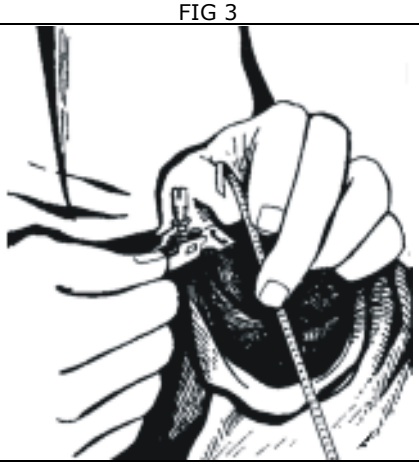



FIG 6	FIG 7	FIG 8

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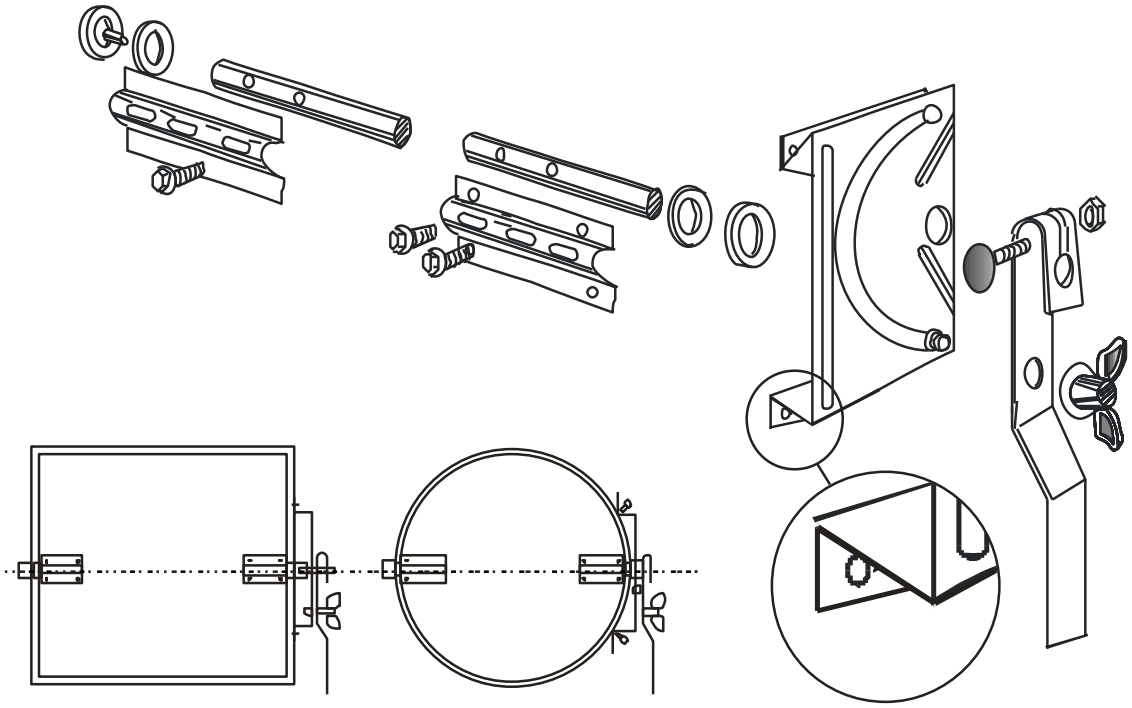
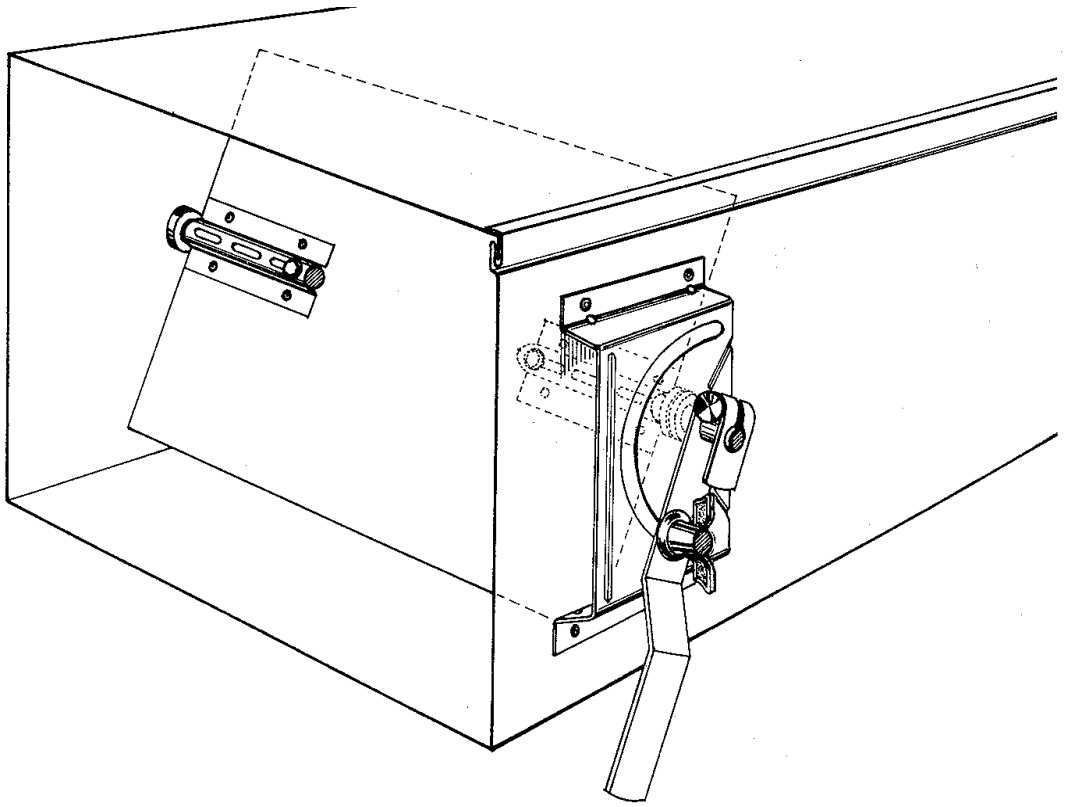
4.5 MOUNTING INSTRUCTIONS
Quadrant DAM010



Adjust the raised edges for smaller duct diameters (<200mm)



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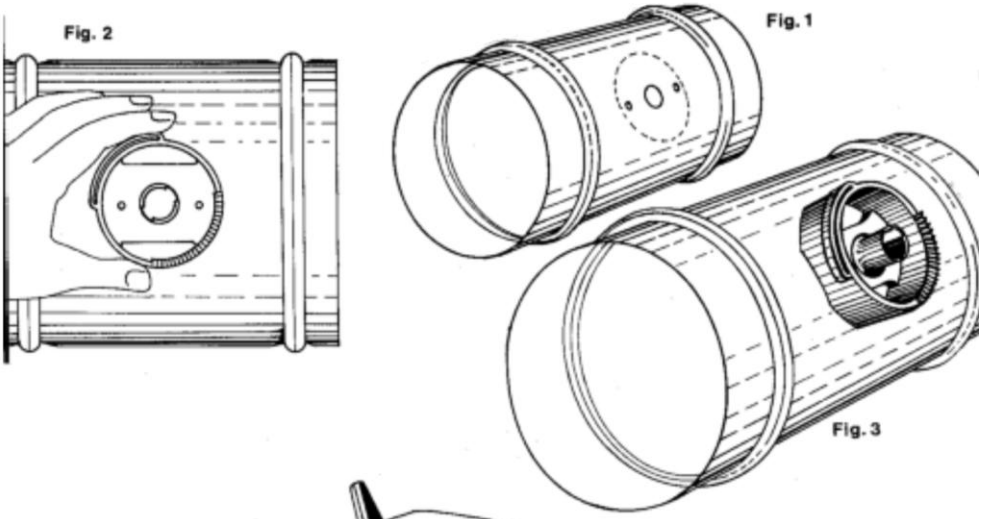
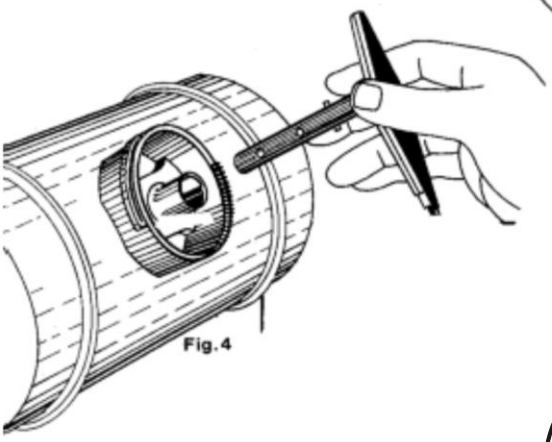
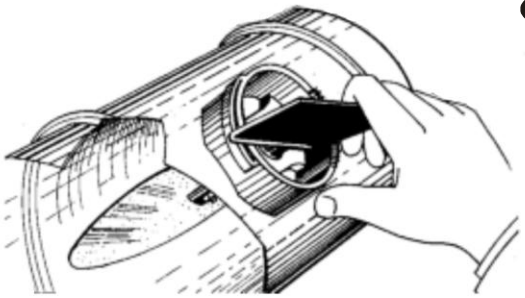
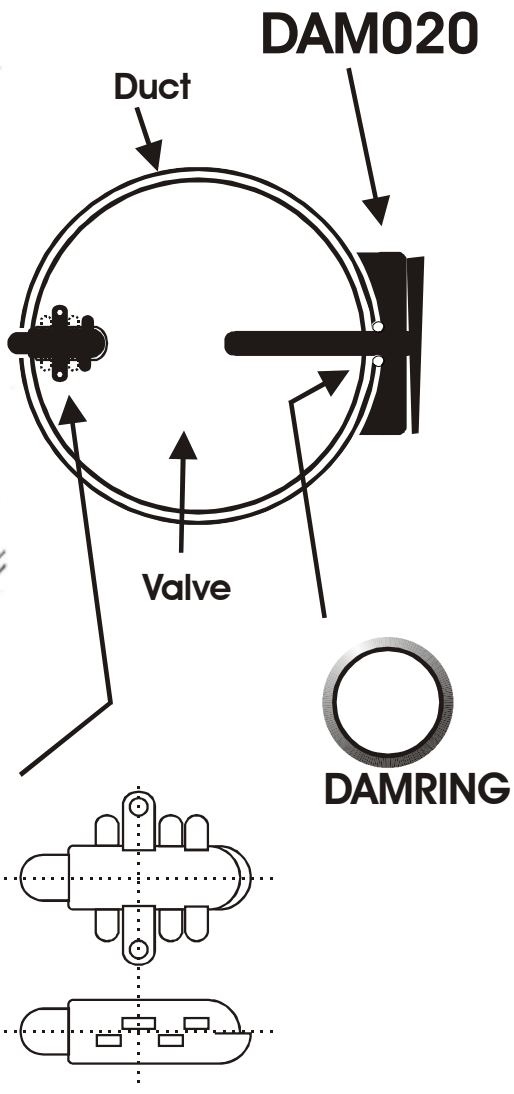
4.6 MOUNTING INSTRUCTIONS
Quadrant DAM020









DAMCO

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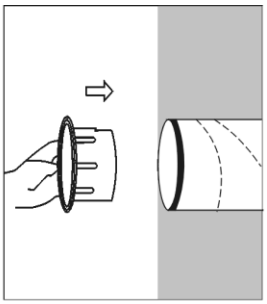
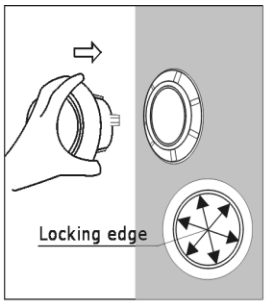
4.7 MOUNTING INSTRUCTIONS

DVKR valve

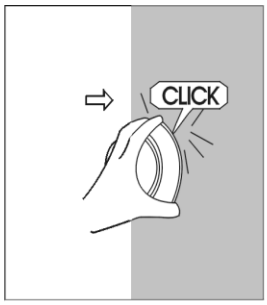
with integrated connection bush and retaining ring.



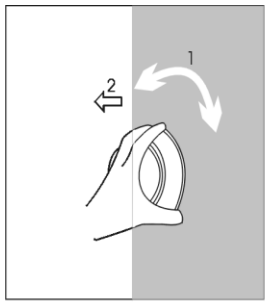
Installation of connection bush in wall



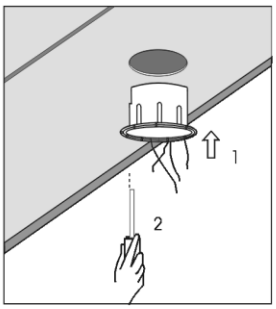
Installation valve in connection bush in wall. Ensure that one of the "valve wings" points towards the centre of a locking edge



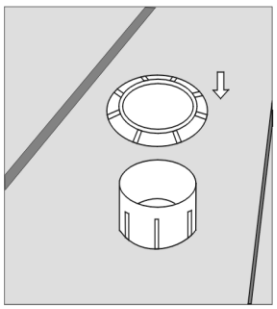
Press the valve until it clicks into position



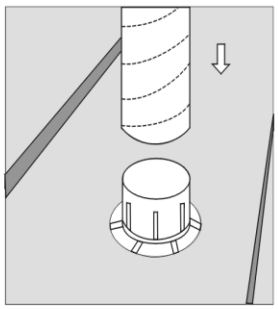
Removing the valve: rotate in either direction until valve disengages from connection bush. Pull straight out



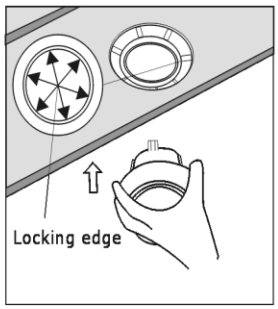
Installation of connection bush in false ceiling. Fixate with screws



Installation of retaining ring for false ceiling panel



After mounting flexible duct on connection bush:
1. Tape off with alu tape
2. Fixate with clamps



Installation of valve in connection bush. Ensure that one of the "valve wings" points towards the centre of a locking edge

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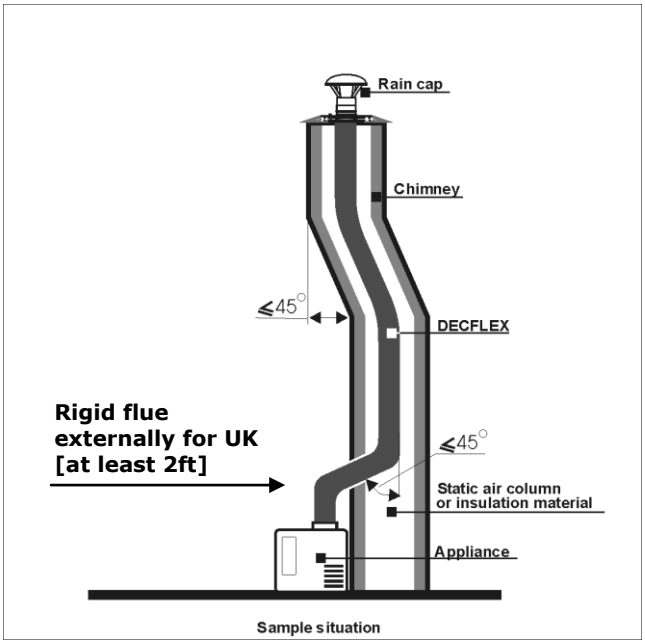
4.8 ASSEMBLY INSTRUCTIONS DECFLEX

FLEXIBLE CHIMNEY TUBE LINING



TECHNICAL DATA								
Nom. diameter inside (mm)	Ø 80	Ø 90	Ø 100	Ø 110	Ø 120	Ø 130	Ø 140	Ø 150
Diameter outside (mm)	Ø 87	Ø 97	Ø 107	Ø 117	Ø 127	Ø 137	Ø 147	Ø 157
Tolerance	-0, +1 % x Ø							
Wall thickness	0.12 mm							
Quality	AISI 316Ti/DIN 1.4435, AISI 316Ti/DIN 1.4571 & AISI 904L /DIN 1.4539							
Life expectancy	5 - 10 years							
Minimum bending radius	3 x diameter							
Maximum slope angle in relation to the plumb line	45° for moderately condensing appliances 30° for strongly condensing appliances							
Weight per metre (kg)	0.57	0.64	0.71	0.79	0.86	0.93	1.00	1.07
Design load N	250	250	300	300	300	300	300	300
Temperature resistance °C	200, 450							
Application	Negative- and Positive pressure							

Extra information: flexible stainless steel tubing system

- Apply only in existing flues.
- Product has a limited life span.
- Not suitable for discharging combustion gases containing halogen.

It is recommended to use the tubing in an existing channel with a minimum diameter of: outside diameter + 10 cm.

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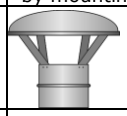
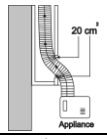
4.8 ASSEMBLY INSTRUCTIONS DECFLEX

Read these assembly instructions carefully before installation.
Follow the steps below in the right order for the correct installation of the flexible chimney tube lining. Personal protective gear, such as gloves and safety goggles for eye protection, must be worn at all times. **Watch out** for the far ends of the lining. These may be sharp and can spring back while unrolling, installing and finishing. Always keep your face at a safe distance.
EXAMPLE: Assembly instructions specific for ADAP(1&2)-PW

1.	Make sure the chimney flue has been thoroughly swept before installation, as remaining deposits may affect the lining.
2.	Remove the chimney neck (the brick-on-edge coping), making the flue freely accessible.
3.	Select the diameter for the flexible lining. Lower a wooden sweep cone **ADAC** through the entire channel to check for any objects that may obstruct the passage. The cone must easily pass through the channel. Apply a smaller diameter when any obstacles are encountered, provided that the resistance for the appliance to be connected does not become too high. The cavity between the chimney wall and the flexible lining must be at least 5 cm.
4.	The required amount of lining can be determined using the rope connecting to the cone. Cut the lining at the required length after installation is completed. The chimney flue must have a flexible lining out of one piece. The maximum slope angle is 45°.
5.	Wear working gloves and safety goggles once you start using the chimney tube lining; the edges of the lining can be sharp.
6	Install the sweep cone using self-tappers to the flexible tube. **Note**: on double-walled linings the flow direction of flue gases is shown by arrows.
7.	Pull the lining through the channel from the top. One person pulls, while a second person guides the lining through the chimney opening. This is to avoid any damage to the lining while pulling. Pull the lining far enough to allow room for connecting to the appliance.
8.	The lining should somewhat stick out from the top of the channel, making the far end of the lining level with the top of the brick-on-edge coping after installation.
9.	Cut the lining to the correct length if necessary, using a right-angle grinder or a metal saw (figure A). Level any sharp edges and protrusions to avoid damage to the ring. The lining must not be butted or damaged. Ensure the far ends of the lining have been carefully finished at right angles.
10	Screw the adapters on the ends (fig B + D) **NOTE**: **ADAP1**-**PW** is for the bottomside and **ADAP2-PW** is for the topside. **Only for overpressure systems:** Carefully inject the **Ht**-**Kit** into the holes around the adapter, **pay good attention** that the chambers are well filled (between liner and adapter) by means of filling all holes one by one until you have been round (fig E). Before mounting the **ADAP2-PW** confirm you have slided the roof plate **ADAP4** over the liner.
11.	Fit and fix the assembly bracket **FLS** around the lining. Clamp the **FLS** securely around the lining but ensure the lining remains round. Note the correct diameter of the bracket! (See figure C).
12.	Centre the far end of the lining with the **FLS** in the channel and secure the same in a layer of concrete (figure C). Re-build the brick-on-edge coping.
13.	Secure the roofing sheet onto the brick-on-edge coping after the concrete has set.
14.	If the cavity is not filled with an insulation material, such as vermiculite, it should be ventilated. This is possible by mounting a cover plate with a pre-fabricated opening of 5 cm^2 in such a way that watering will be prevented.
15.	 Place the rain cap **FLRC** in the adaptor **ADAP2-PW** and fix the unit with a clamping bracket **FLCR**. See the technical specifications for available diameters. In the case of a thatched house it is recommended you first check your insurance policy conditions for a hood fitted with a spark catcher.
16.	 Check that the lining at the bottom of the chimney at the feed-through aperture cannot be damaged by the sharp edges of the chimney flue. If an air cavity is being used: make a (ring-shaped) opening at the passage through the chimney wall of at least 20 cm^2 for ventilation in the cavity, provided that the slope angle is ≤ 45°. A rigid flue has to be used externally in the United Kingdom!
17.	In the installation space of the gas appliance the unprotected tubing may not exceed 20 x D_{nom}. Put the tubing in a vertical position when possible. The angle in relation to the plumb line may not exceed 45°. Always retain a distance of at least 50 mm to the wall. If necessary, use a wall bracket to prevent sagging of the lining (see technical specifications for the available sizes).
18.	Determine the required length of the lining, taking into account the height of the adapter (**ADAP1-PW**). If there is talk of overlengte: work the sheathing finished defined as in point 9.
19.	For positive pressuresystems one uses the **Ht**-**Kit** with the **ADAP1-PW** and for underpressure systems not.
20.	Put the adaptor in the connection point of the appliance.
21.	Attach an identification plate on the chimney in the installation area near the entry point of the lining, for the chimneysweeper and/or maintenance engineer to see that flexible lining has been used.

See the installation manual for detailed information on applying linings in chimney flues. This manual is available from **DEC International®** on request.
General: in practice, depending on the situation, other installation methods are also used. The lining manufacturer has no control over these methods.
However, various accessories are available to make the work easier, such as a T-piece and a condense drain. See the technical specification for available diameters and assembly options.
The Fluegas evacuation (and the air supply) always must satisfy to the installation regulations of the appliance manufacturer and to the National building regulations.

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4.8 ASSEMBLY INSTRUCTIONS DECFLEX

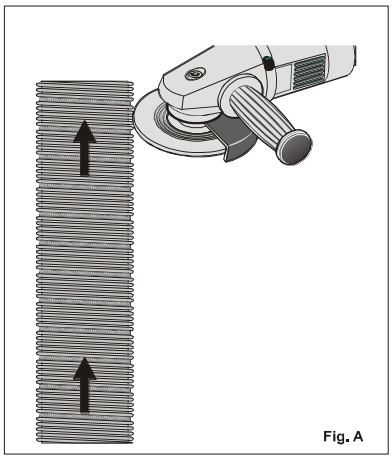
Fig. A

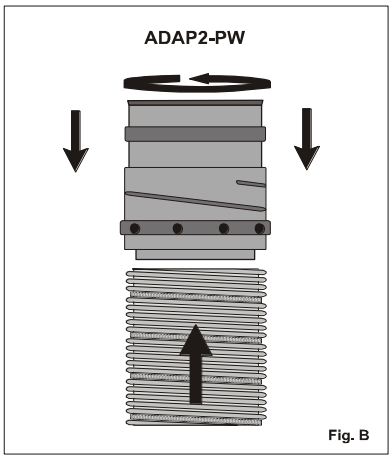

Fig. B

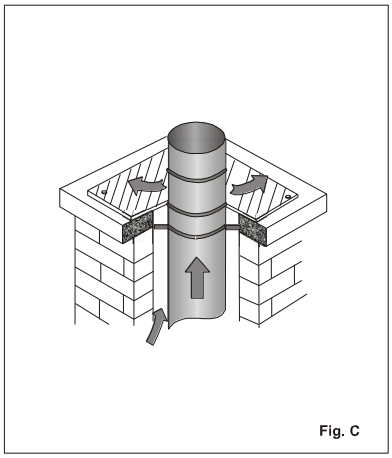
Fig. C

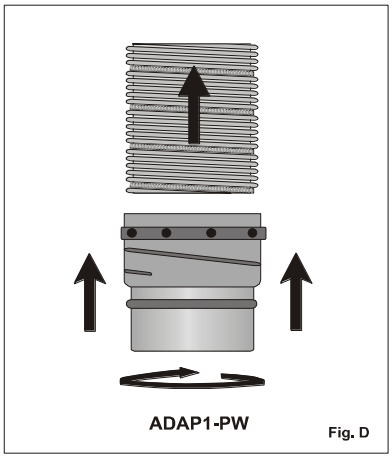

Fig. D

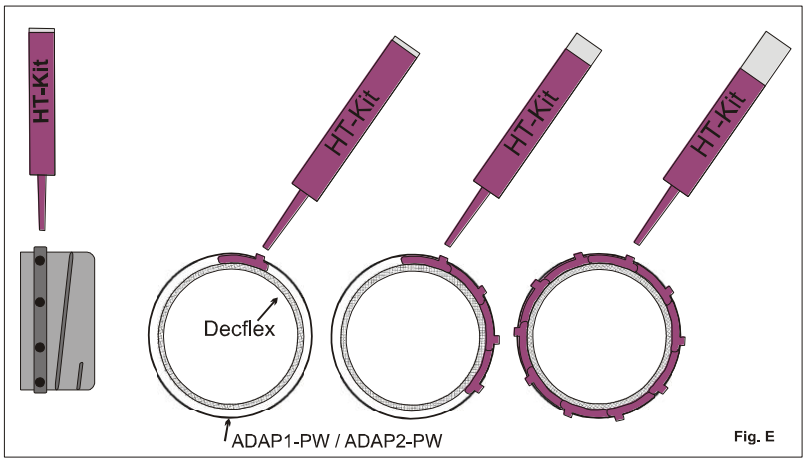

Fig. E

The illustrations serve as an example, the manufacturer takes absolutely no responsibility concerning the eventual implementation.

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5.0 PRESSURE LOSS

The effect of a few parameters on the friction coefficient and the resistance coefficient in DEC International®-ducts and -bends has been investigated by TNO, report number 90-042/R.24/LIS. The following parameters have been examined: duct type, duct diameter, compressing (lengthwise), direction of flow, air velocity and the shape of the bends.

From this research the following became evident:

- The duct type affects the friction coefficient only in ducts which have been stretched completely (0% compressing). The measure of compressing has e great effect on the friction coefficient. A 5% compressing could already redouble the friction coefficient. The effect of the duct type can be neglected then.
- The effect of the duct diameter (102 mm - 305 mm), the air velocity (2 m/s - 6 m/s) and the direction of flow on the friction coefficient can be neglected.
- The resistance coefficients of the bends hardly depend on the duct type.

The results of the research will be given in pressure loss charts.

NOTATIONS:

D	duct diameter	[m]
f	friction coefficient	[-]
i	compressing percentage according to formula (3)	[-]
k	wall roughness	[m]
L	real duct length	[m]
Le	equivalent length according to formula	[m]
Li	length inflow section	[m]
Lm	maximal duct length	[m]
Δp	pressure loss	[Pa]
P_b	barometer pressure	[mbar]
Ph	pressure in test department	[Pa]
R	radius of a bend	[m]
Re	Reynolds number	[-]
T	temperature	[oC]
U	average velocity	[m/s]
ζ	resistance coefficient	[-]
ν	kinematic viscosity	[m^2/s]
ϱ	density	[kg/m^3]

5.1. INTRODUCTION

The pressure loss in a duct, consisting of one or more straight parts and some bends, depends among other things on the friction coefficients of the ducts and the resistance coefficients of the bends.
In order to find the pressure loss in a duct, the coefficients must be known.
TNO measured the effect of some parameters on those coefficients.

While investigating the ducts the effect of the following parameters on the friction coefficients has been examined:
- Duct type
- Duct diameter
- Degree of compressing
- Direction of flow
- Air velocity

While investigating the bends the effect of the following parameters on the resistance coefficients has been examined:
- Shape of the bend
- Duct type

On behalf of the research a measurement setup has been built up (see **fig. 3**).

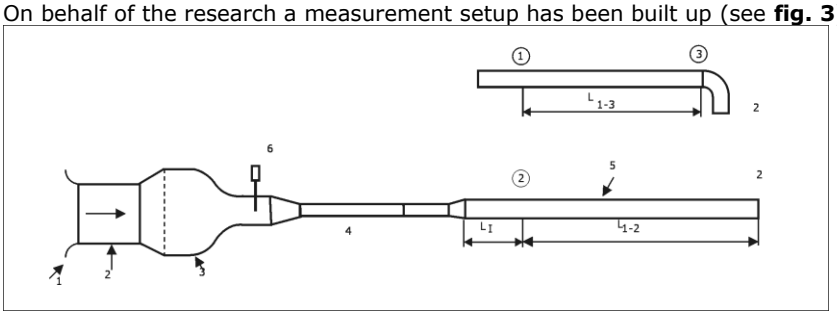

Figure 3

The formulas, making out the pressure loss of a straight part or a bend, will be given in **5.2**.
Hereby we will go further into the effect of the duct diameter, the roughness of the inner duct wall and the Reynolds number on the friction coefficient.
Secondly we will go further into the equivalent length of the bends.

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5.0 PRESSURE LOSS

5.2. PRESSURE LOSS

In general a mounted duct has a few straight parts and a few bends. If a gas is flowing through the duct a pressure loss will occur in each straight part and each bend of the duct. When determining the conveying height of a fan, the pressure loss of each straight part and each bend of the duct has to be determinated.

5.2.1 STRAIGHT PART OF A DUCT

The pressure loss (also called pressure drop or resistance) of a straight part of a duct can be calculated with the next formula:

$$\Delta p = f \cdot \frac{L}{D} \cdot \tfrac{1}{2}\varrho U^2$$

Δp	=	the pressure loss	[Pa]
f	=	the friction coefficient of the duct	[-]
L	=	the (real) length of the duct	[m]
D	=	the diameter of the duct	[m]
ϱ	=	the density of the gas	[kg/m3]
U	=	the average velocity	

From this formula the following can be deducted:

- the pressure loss is proportional to the friction coefficient
- the pressure loss is proportional to the density of the gas. For (dry) air the density is:

$$\varrho = 1.293 \cdot \frac{P_b}{1013} \cdot \frac{273}{273 + T}$$

P_b	=	the barometer pressure in millibar
T	=	the temperature in °C

From the Moody-diagram [1] for ducts can be deduced that:
- The friction coefficient decreases slightly if the value of the Reynolds number (**Re = U.D/ϱ**) increases
- The friction coefficient decreases if the relative roughness decreases **k/D**

From this it follows that:
- The friction coefficient decreases slightly if the velocity increases (higher Re-number)
- The friction coefficient decreases if the diameter increases, if the wall roughness stays the same (higher Re-number and decreasing relative roughness)

The wall roughness is determined by:
- The duct type
- The extent of compression

The measure of compressing will be defined as follows:

$$i = \frac{L_m - L}{L_m} \cdot 100\%$$

Lm	=	the maximal duct length
L	=	the real duct length

The effect of the duct on the friction coefficient has been determined with a 0% compression.
The real length of the duct is then equal to the maximal length.

5.2.2 BENDS

The pressure loss of a bend can be determinated with the following formula:

$$\Delta p = \zeta \cdot \tfrac{1}{2}\varrho U^2$$

Δp	=the pressure loss		[Pa]
ζ	=the resistance coefficient of the bend		[-]
ϱ	=the density of the gas		[kg/m3]
U	=the average velocity		[m/s]

The pressure loss in a duct bend is greater than the pressure loss in a welded bend with the same diameter and radius of curvature. Because the friction losses in a bend are considerable greater. In a metal bend the inner wall is smooth in contrast to a duct bend. Especially the inner bend of the duct will compress intensely. Because of this the flow-through surface becomes smaller and the flow velocity higher.

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5.0 PRESSURE LOSS

5.2.3 EQUIVALENT LENGTH
The equivalent length of a bend is the length of a straight duct, from which the pressure loss is equal to the pressure loss in the bend. This equivalent length follows from:

$$\Delta p_s = f \frac{L}{D} \cdot \tfrac{1}{2}\rho U^2$$

$$\Delta p_b = \zeta \cdot \tfrac{1}{2}\rho U^2$$

To $\Delta p_s = \Delta p_b$ the formula is:

$$f \frac{L_e}{D} = \zeta$$

$$L_e = \frac{\zeta}{f} \cdot D$$

The equivalent lengths of the tested ducts of the Ø 102 mm Aludec® 70 have been determinated with this formula.

5.3. DIAMETER
At four out of the five duct types, which have been investigated, the friction coefficient hardly depended on the duct diameter. Only the Greydec® 100 had an increasing of the friction coefficient with the diameter. It appears that if the roughness of the duct wall stays the same, the friction coefficient decreases if the diameter increases. The increasing could be explained by presuming that the 203 mm and the 305 mm Greydec® ducts must have had a certain degree of compressing. Although they have been stretched till maximum stated length. If we leave the measure results of the Greydec® 100 out of consideration, the effect of the duct diameter on the friction coefficient could be neglected.

5.4. VELOCITY
In flexible ducts the friction coefficient slightly decreases if the velocity increases.
It appears that for DEC-ducts this is also the case with the Greydec® 100, the Aludec® 70 and the Aludec® AA3, but in a less degree with the Aludec® 112 and the Sonodec® 25. In general the effect of the velocity on the friction coefficient is small. It can be neglected with respect to the effects of the duct type and the degree of compression.

5.5. DIRECTION OF FLOW
The friction coefficient of the Aludec® 70 has been measured in both the flow directions. Due to the manufacturing method one flow direction provides a sudden (very small) narrowing at each overlap, whilst the other flow direction provides a sudden (very small) expansion. From the measurements it appears that the average value of the friction coefficient of the duct just in one case differs 5% from the other direction. In general this difference can be neglected.

5.6. COMPRESSION
The compression of the ducts has a great effect on the friction coefficient (**figure 4**). It appears that, if a duct will be compressed only 5%, this already leads to a roughly double friction coefficient (**figure 4**).
Apparently, the roughness of the inner duct wall increases strongly if the compression is very small. Figure 4 also shows that the friction coefficient increases almost linear during compressing, provided that the compression is less than 20%. To each percent of compressing the increasing of the friction coefficient is ca. 0.01. If a duct has been compressed only 3% the friction coefficient will increase ca. 0.03. The increasing is the same as the differences of the five duct types, which have been measured.

Figure 4

5.7. FRICTION COEFFICIENTS
From the above it follows that the effects of the duct diameter, air velocity and direction of flow on the friction coefficients of the ducts can be neglected. It also appears that the degree of compressing has more effect than the duct type. To determine the degree of compressing with formula 4, information on the maximal length of the concerning duct will be needed. The maximal length, however, depends on the size of the effort determining this length. Besides, a certain force at a duct with a small diameter, causes a greater tensile stress than at a duct with a larger diameter and the same wall thickness. In this research the friction coefficient for the different duct types only applies for ducts, which have been stretched to the same length as the ducts which have been tested.

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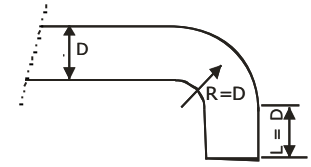
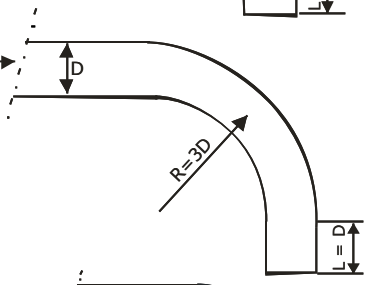
5.0 PRESSURE LOSS

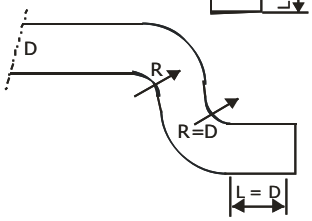
RESISTANCE COEFFICIENT OF THE BENDS
Figure:

1a 

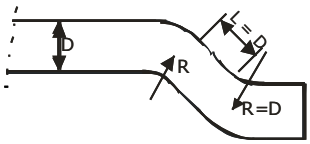
ζ= 3.6

1b 

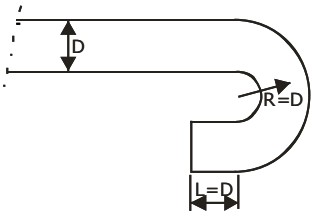
ζ= 3.0

1c 

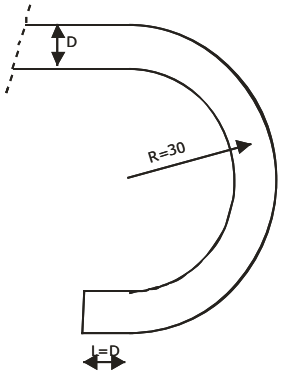
ζ= 6.2

1d 

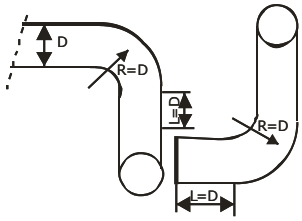
ζ= 4.1

1e 

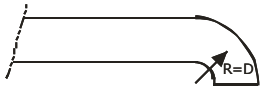
ζ= 4.7

2a 

ζ= 5.1

2b 

ζ= 4.8

2c 

Greydec 100 ζ=2.2
Aludec 112 ζ=2.5
Aludec AA3 ζ=2.7
Sonodec 25 ζ=2.7

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5.0 PRESSURE LOSS

5.8. RESISTANCE COEFFICIENTS OF THE BENDS

The resistance coefficients of the bends have been mentioned in the **figures 1** and **2**. It appears that the air velocity has hardly any effect on the size of the resistance coefficient. From the **figures 1a, 1b, 2a and 2b** it appears that an increasing of the curvature radius of the 90°-bend provides a decreasing of the resistance coefficient. The 180°-bend, however, shows an increasing. This is against all expectations. Probably this is due to the small differences of roughness of the bends, because the compression of the bends will differ from one another. A difference in flow model in both the bends could also be the cause. The duct type seems to have only a small effect on the resistance coefficient of the bends (**figure 2c**). This was to be expected. The inner bend is always compressed in such a way that its roughness is much larger than the roughness of the (maximally stretched) ducts.

5.9. PRESSURE LOSS CHARTS

Pressure loss charts have been made for the different types of DEC-ducts and DEC-ends.
The charts show the pressure loss per meter duct for 0°C air.

The charts for the different duct types have been given in the following figures

GREYDEC® 100	(f=0.033)
ALUDEC® 70	(f=0.037)
ALUDEC® 112	(f=0.053)
ALUDEC® AA3	(f=0.031)
SONODEC® 25	(f=0.053)

The charts for the ALUDEC® 112 and the SONODEC® 25 are identical.
If the air has a temperature different from 0oC the pressure loss should be multiplied with a correction factor. This correction factor is 273/(273+T).

Emphatically it has been stated that the charts apply to ducts, which have been stretched maximally (compression 0%).

The pressure loss charts on the bends according to the **figures 1 and 2**, are given in **5.11a**.
These charts apply to air with a temperature of 0°C. Also here it applies that, if the air has a temperature other than 0°C, the pressure loss has to be multiplied with the correction factor. In order to make the charts resistance coefficients have been applied, as mentioned in the **figures 1 and 2**. The avarage value of the measured coefficients has been used (2.6) for the bend according to **figure 2c**.

5.10. CONCLUSIONS

- The friction coefficients of five different DEC-ducts have been determined in a measurement setup. The results have been given in a chart. The friction coefficients are applied to ducts, wich have a 0% compression. On behalf of the effect of the compressing of the duct the effects of duct diameter, air velocity and direction of flow on the friction coefficients are to be neglected.
- Compressing a duct lengthwise, in some degree, will lead to a strong increasing of the friction coefficient. If compressing ca. 5% a redoubling of the friction coefficient appears.
- Charts have been made for the different duct types on the basis of the measured friction coefficients.
- The resistance coefficients of eight different bends have been measured. These coefficients seem to be independent of the air velocity and the duct type has only a small effect. The resistance coefficients of the duct bends have been given in the **figures 1** and **2**.
- Pressure loss charts for the bends have been made on the basis of measured resistance coefficients.
- If the air has a temperature different from 0°C the pressure loss should be multiplied with a correction factor. This correction factor is 273/(273+T).
- With respect to the wire distance the type of the tested ducts are a reflection of the several types of flexible ducts out of **DEC International®**'s delivery program. Compressing affects the pressure loss most seriously. The duct type has hardly any influence on pressure loss in bends. Therefore DEC International® has deduced the pressure loss diagrams from the following duct types:

***Duct type*:**	***Deducted from*:**
Aludec® (2)45	**Aludec® 112**
Combidec® 2000	**Aludec® AA3**
Combidec® 2100	**Aludec® 245**
Combidec® 2300	**Aludec® 112**
PVC white	**Aludec® AA3**
Isodec® 25	**Sonodec® 25**
Isodec® 250	**Aludec® 112**
Sonodec® 250	**Aludec® 112**
Sonodec® GLX	**Aludec® 112**
Sonodec® TRD	**Sonodec® 25**
CE-FLEX®	**Aludec® AA3**

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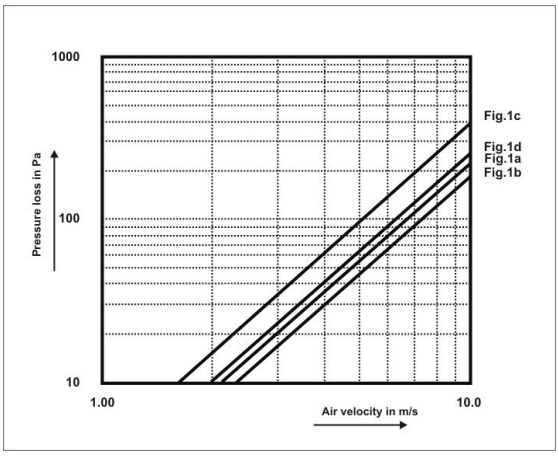
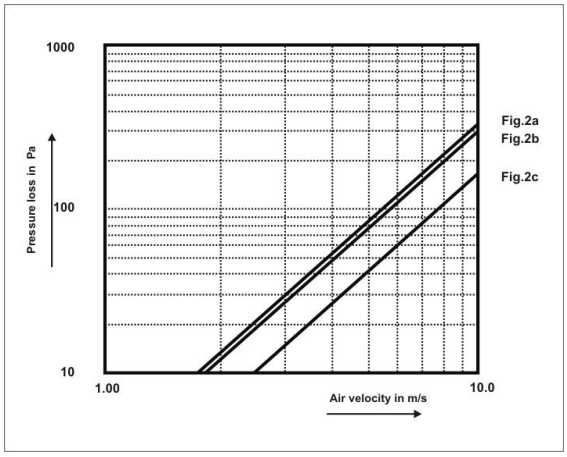
5.0 PRESSURE LOSS

5.11 GRAFICS

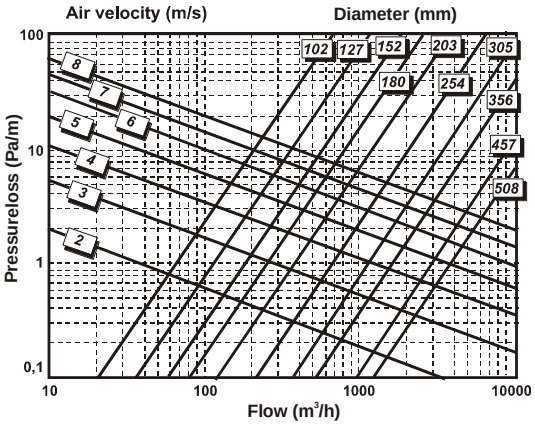
5.11a PRESSURE LOSS OF THE BENDS



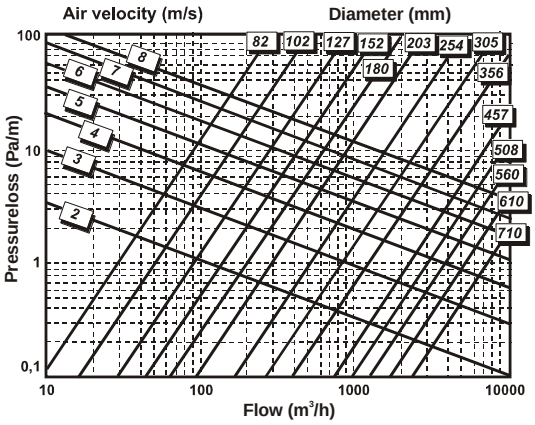


5.11b PRESSURE LOSS DEC DUCTING

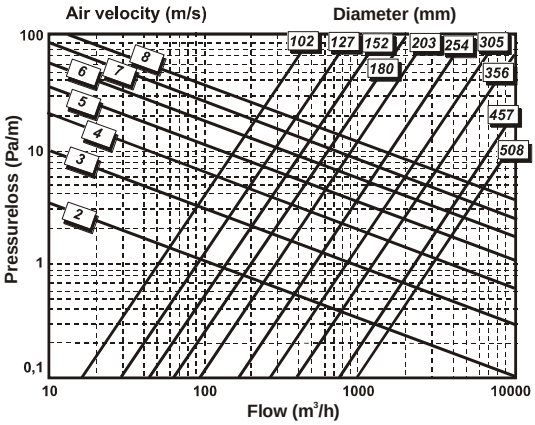
Aludec® AA3



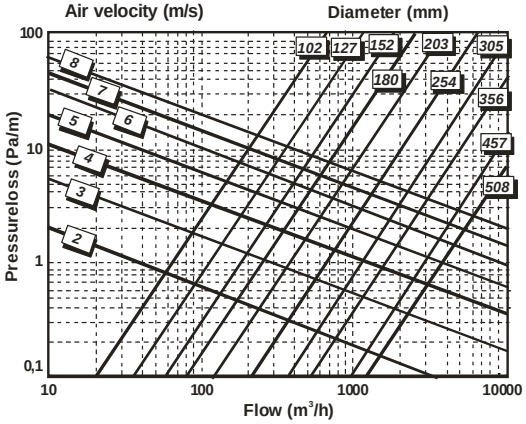
Aludec® 112



Aludec® 245



CE-FLEX®



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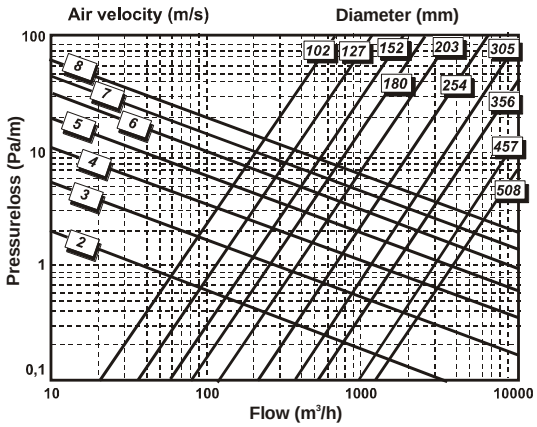
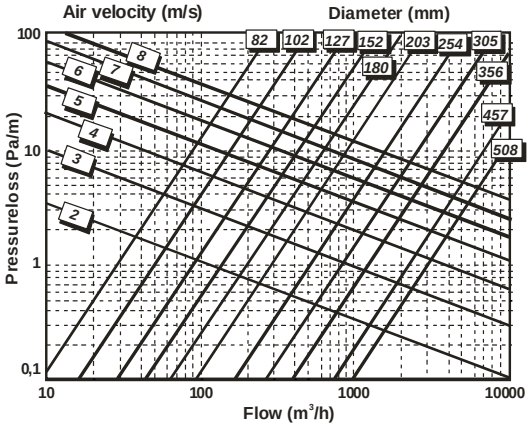
5.0 PRESSURE LOSS

5.11b PRESSURE LOSS DEC DUCTING

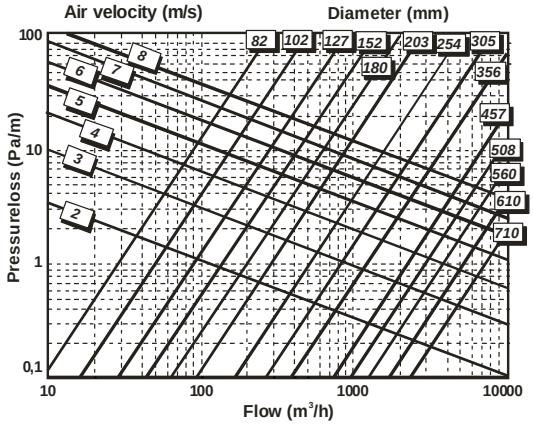
Combidec®2000



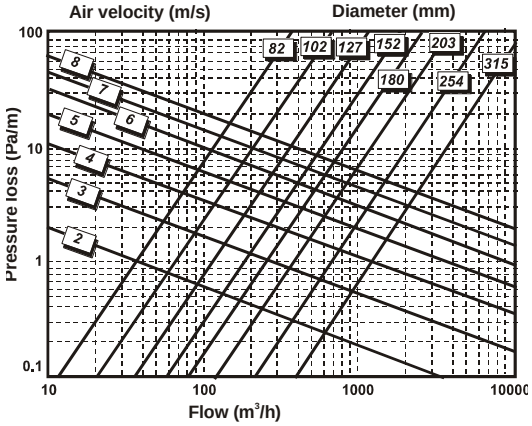
Combidec® 2100



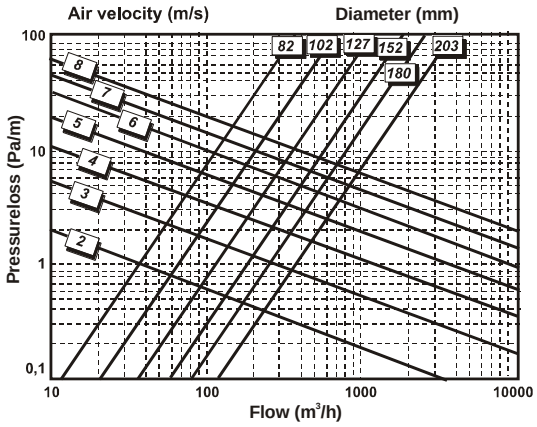
Combidec® 2300



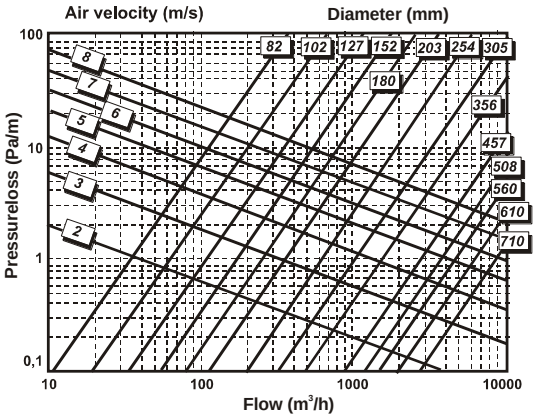
Stretchdec®



PVC Wit



Greydec® 100



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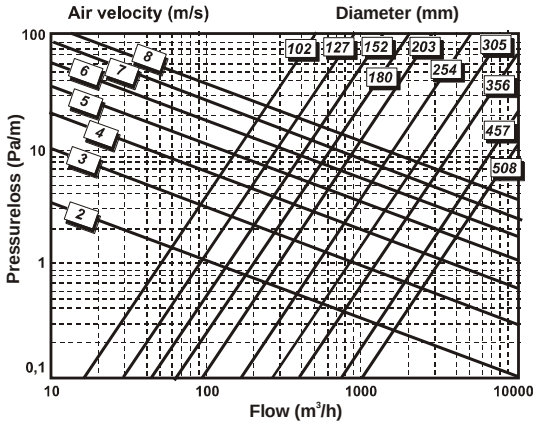
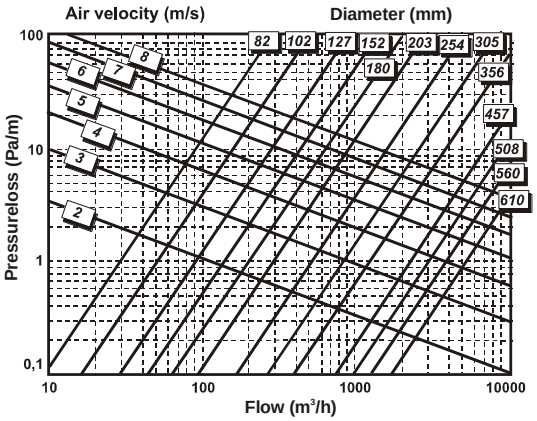
5.0 PRESSURE LOSS

5.11b PRESSURE LOSS DEC DUCTING

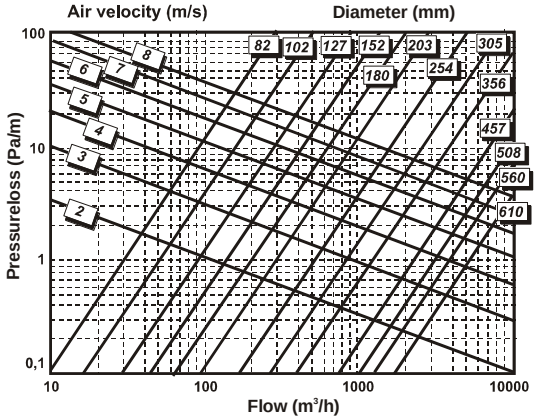
Isodec® 25



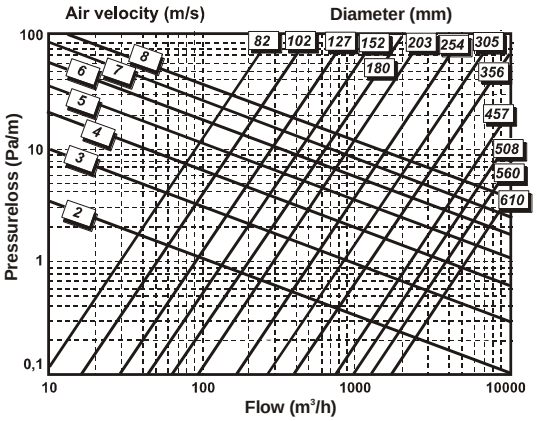
Isodec® 250



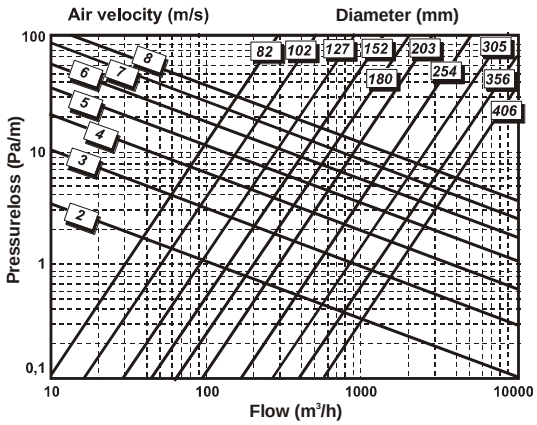
Sonodec® 25



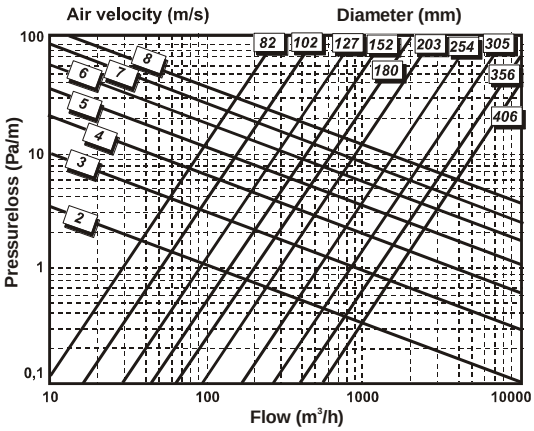
Sonodec® 250



Sonodec® TRD



Sonodec®GLX



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6.0 NEGATIVE PRESSURE

6.1. INTRODUCTION

One of the major elements in a ventilation system is pressure. Air pressure is used absolutely as well as relatively for the density of molecules in a space. If the density is high, the pressure will be high and vice versa. If working with ductwork and ventilation systems, the density can be compared with a density of molecules somewhere else. This is called a difference in air pressure. Since we live in a more or less standard air pressure of about 1000 hectopascal, pressures could be related to this standard pressure.
A ventilator, pulling air out of the atmosphere and pumping it into a volume, will create a certain pressure difference between the atmosphere and the volume. In this report we just mention pressure if it is related to standard pressure. Since the difference can be positive or negative we will mention positive and negative pressure. Both have been measured in relation to the standard air pressure.
Air ventilation systems can use both positive and negative pressures. This depends on the fact if air has been extracted from or pushed into a volume.

A ventilator, getting fresh air from outdoors, will at first cause a certain negative pressure in the ductwork, between the air inlet and the fan. This negative pressure causes an airflow from outdoors (where the pressure is higher) into the inlet. Depending on the air-resistance of the inlet and the power of the fan, this pressure could increase to dangerous values for our products. In this report we will explain what happens, if negative pressures occur in a duct and what protective action could be taken in order to prevent the ductwork from getting damaged.

6.2. THE DIFFERENCE BETWEEN POSITIVE AND NEGATIVE PRESSURE

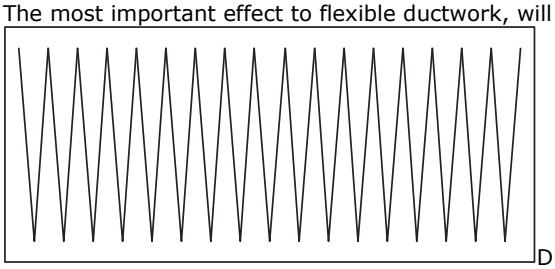
It is very important to consider that positive and negative pressures do not have the same effect on ductwork. A positive pressure in a volume will yield a force of which the direction is pointed outwards. This force is caused by collisions of molecules to the wall of the volume.

6.3. NEGATIVE PRESSURE IN FLEXIBLE DUCTS

If air has been blown into a balloon, the volume will expand. The higher pressure inside the balloon will give a force and this force will push the wall of the balloon in all directions. Due to the fact that the wall increases in tension, thus causing a reverse force, a balance will be created and the expansion will be brought to a halt. Actually, a negative pressure inside a volume gives the same physical result. A force has been created, but now the direction points inwards the volume. The behaviour of the volume depends on the size and the wall structure.
Large volumes appear to be more sensitive to pressure than small volumes. This is clarified by the fact that pressure is equal to a force, being applied to a certain area.
A 1000 Pa pressure would result in a force, caused by a 100 kg weight resting upon an 1m2 area.
Enlarging the volume (larger diameter) will result in a bigger total force, being applied to the wall surface.
It needs no explanation that a flexible duct with a larger diameter has less resistance to negative pressures.
A flexible duct could be damaged by negative pressure in two ways. The duct will either be squeezed or subjected to the, so called, domino effect.
Both ways of damaging duct will be explained below.

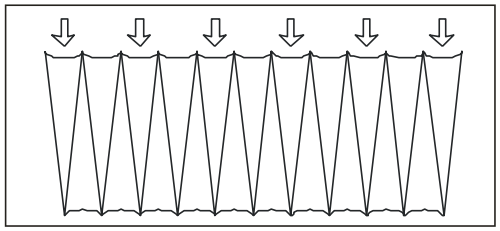
6.4. THE DOMINO EFFECT

Depending on the structure of the flexible duct several effects can occur.
The most important effect to flexible ductwork, will be shown in the next few drawings.


Drawing 1.

(**Drawing 1**) This is the normal position of the wire helix inside the wall of a flexible duct, as seen from the side.
The wires of two neighbouring windings are connected with the laminate of the duct. Depending on the nature of this material, the wire spacing can be different. The wire prevents the duct from dents etc. The laminate, however, gives an either stiff or souple behaviour to the duct.
We already explained that the force, caused by a negative pressure inside the duct, points inwards the duct. Normally, the direction is perpendicular to the duct wall. In that case the wire, as well as the laminate, will have to resist the force.

The force has been indicated by arrows, in **drawing 2**.
The tear resistance of the wall material will now determine the maximum applicable force.


Drawing 2.

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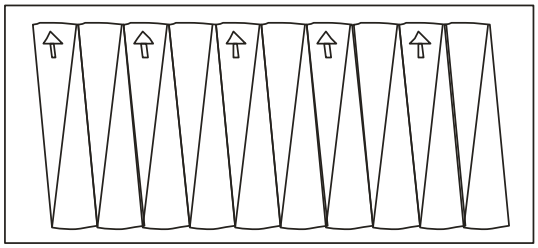
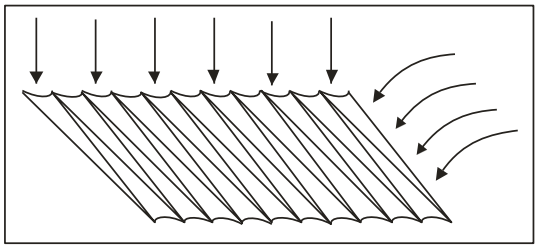
6.0 NEGATIVE PRESSURE

This would, more or less, be the same as the maximum positive pressure, of which the arrows point in the reverse direction (**drawing 3**).

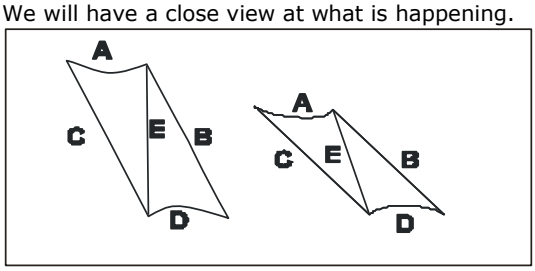

Drawing 3.

Unfortunately this is not the case. What, in fact, happens is that the windings will fall like a row of domino stones (see **drawing 4**). With this movement the volume, inside the duct, has been decreased by the pressing force from outside.


Drawing 4.

For this effect a force with much less strength is enough. It is useful to know which of the important parts of the duct determine the resistance to this domino-effect.

We will have a close view at what is happening.



Drawing 5.

Let us assume that a small piece of duct, drawn at the left, is more or less rectangular. If this has been deformed into the shape of the drawing at the right, the shape becomes a rhomboid. Two major effects will counteract such a movement:

Effect 1 - The wire E will be shortened and the wires B and C will get slightly longer. This has not been done by stretching and shrinking, of course, but a piece of 'E' has been given to B and C. One can imagine, that this has been caused by shifting in the warp direction of the wire in the overlap. The wire E will get a sharper curve, the wires B and C will have a less sharp curve. This deforming of the original form of the wire has been counteracted by the wire itself.

Effect 2 - The laminate A, in **drawing 5**, will not result in any effect, since the distance between the windings at this place remains the same. The same goes for the laminate D at the bottom. The material in the middle of the duct, between B and C, will cause a certain resistance against this movement. This resistance can be compared by taking a piece of paper in a 'portrait' position, while pressing the four corners of the paper against the table with both hands. Use thumbs and forefingers. Now move the left hand away from you, while pressing the two left corners against the table.The paper starts to fold in the middle.You have tried to make a rhomboid out of a rectangular. The same effect occurs with the laminate between each of the two windings, at the side of the duct. Depending on the nature of this material the deforming can be easy or difficult.

Depending on the nature of the materials, mentioned in 1 and 2, the movement in **drawing 5**, will be counteracted with more or less force. However, this force is much less than the force, needed to tear the material itself. This will be done when too high a positive pressure is applied. Therefore the maximum negative pressure, which a flexible duct can resist, is much less than the maximum positive pressure.

With this conclusion, we come to one of the determining elements of the behaviour of a flexible duct with negative pressures.

How can we give optimal resistance to negative pressures?

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6.0 NEGATIVE PRESSURE

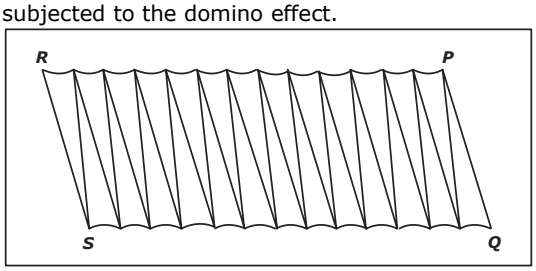
To achieve this, it is necessary to minimize the chance of the domino effect.
There are several possibilities of minimizing the chance:

1 Stiffer material could be used for the duct wall. The stiffer material will not fold easily and therefore it would be more difficult to deform the rectangular of drawing 5. A less flexible product, however, would be the consequence. In practice it has been shown that an Aludec 112 has a better resistance against negative pressures than a PVC duct has.

2 Thicker wire could be used. The toughness of the wire will give resistance to the deforming in 'effect 1'.

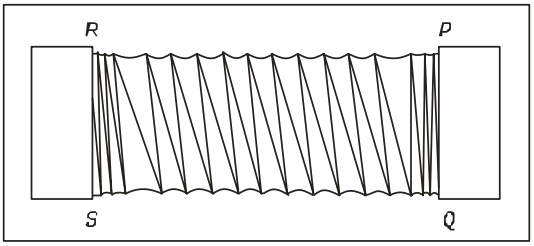
3 When the pitch of the wire helix has been decreased, it will be more difficult to deform the rectangular of **drawing 5**. 'A' and 'D' have become shorter and this results in a closer contact between 'C' and 'B'. It will be less easy to move 'C' in relation to 'B'. Decreasing the wire spacing is a very good method of achieving a better resistance to negative pressures. The price of the duct, however, will increase accordingly.

4 The last possibility is one of major importance! The first three methods have to be performed by the manufacturer, because of the differences in the structure of the duct wall. The last one could be done by the user of the duct, without making any changes to the actual duct structure. Since this last method has a big influence on the capability of the duct to resist negative pressures, we will give much attention to explaining how and why. Referring to **drawing 6**, we see a duct, subjected to the domino effect.



Drawing 6

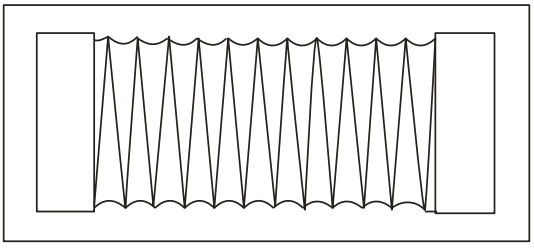
Normally, P, Q, R and S would have been fit to an accessory, which has been attached to the main ventilation system. Therefore P should be straight over Q, the same goes for R and S.
In reality the duct in drawing 6 would have been mounted like **drawing 7**.



Drawing 7

P is straight over Q now and R over S. The first and the last winding of the wire helix will have to be positioned vertically. The windings in the middle are collapsed, due to the negative pressure inside. The windings in the middle, however, can only be subjected to the domino effect, if there is enough clearance in the material at point P and S. The material at Q has been compressed and the material at P has been extracted, in order to give the wire the possibility of moving according to the domino effect.

When no clearance is available, the laminate will keep the wire in position (**drawing 8**). This will be done if the flexible duct has been stretched completely and connected between the accessories with a slight tension. It could be said that each winding of the wire has been pulled from both sides and therefore it is not able to move.
This will prevent the domino effect! This installation method will be more difficult if there have to be curves, formed by the duct. Despite of this it is important to mount the duct in the optimal position and to stretch and connect it properly.
We have discussed the first one of two ways of damaging a flexible duct by negative pressures. The second one is squeezing.


Drawing 8

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6.0 NEGATIVE PRESSURE

6.5. SQUEEZING

This effect occurs if the wire helix of the duct is less strong than the wall structure. This means that the wall structure of the duct has a better resistance against the domino effect, than the wire helix has against squeezing.
The deforming, which occurs if a duct has been squeezed, would be the same as if a heavy object should be placed on the duct. The duct will simply become flat. For this action it will be necessary to deform all helix windings to an oval, or even a flat shape.

The wire will be bent at two places in each winding. It is easy to consider that the resistance against this squeeze-effect improves, if the wire thickness increases or the wire spacing decreases. In the latter case there are more windings to resist the force.

This explains why a vacuum cleaner-duct has a thick wire and a very small wire spacing.

It is very important to consider that the resistance of a flexible duct decreases very much, if the diameter is enlarged. Forces on the surface of a duct with a bigger diameter, will put more strain on the wire helix and therefore the duct will squeeze more easily. When too thin a wire has been used for a very big diameter, e.g. 710 mm, the duct will almost be squeezed by its own weight. A very small pressure can be the key to a full collapse.

A user cannot do much to improve the resistance against squeezing. When a duct reaches the end of its capacity, starts to deform and becomes oval, there is nothing the user can do, except from applying less negative pressure or use a better duct.

6.6. CONCLUSIONS

We have discovered that the behaviour of a duct to negative pressure is worse than to positive pressure. Depending on the diameter and the construction of the duct wall the domino or the squeeze effect will occur. If the domino effect occurres first, the user can take some steps to enlarge the ducts behaviour greatly by installing it in a proper way. But as soon as the squeeze effect occurs you can be sure that the end limit of the possibilities of the duct has been reached.

A test laboratory can examine the behaviour of a flexible duct with negative pressures, but the results will allways refer to the test situation and the form of the duct in that particular situation. Transformation during mounting because of treating the material roughly as well as the way of mounting can be of such a great influence that it would not be correct to give values.

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7.0 FIRE SAVETY OF FLEXIBLE DUCTS

7.1. INTRODUCTION
Why is the fire safety of a duct so important?
An air duct system will be used for the diffusion of the air in a building. This means that the air will be transported from several rooms in the building into a central place: a fan casing or an air conditioning system. When a fire breaks out in one of the connected rooms, there could be a chance that the flames will be transported through the duct system, together with the air which is sucked in.

If the duct system has been built up out of incombustible materials the diffusion in the duct will be restricted. If the system, however, has been built up out of combustible materials there will be a chance that the fire will be transmitted through the duct. In this case the fire can be transferred to a fan casing or an air conditioning system. After destroying these parts the fire will expand to other rooms in the building. A fire is able to reproduce extremely fast to the different stocks of a building by way of air duct systems. Therefore the combustibility of the air duct is of great importance. The wall of a duct has to keep the fire from transmitting as long as possible.

Each country has its own requirements concerning fire safety of ducts and hoses. The requirements are very variously especially comparing Europe with the United States. Many ducts, used in buildings in the United States, are prohibited in Europe for a long time in view of the fire safety. Because no definitive standard has been developed in Europe until now, a manufacturer should have the ducts tested per country, looking forward to a European standard.
DEC INTERNATIONAL® products have been tested in the following countries:

- The Netherlands
- United Kingdom
- France
- Germany
- Austria
- Italy
- Sweden
- Switzerland

In order to give you a general view about the differences and agreements the, most asked, test results per country will be explained. It is not possible to mention all of them, because the test criteria are moving all the time.

7.2 THE NETHERLANDS
Until 1996 the **NEN 3883** was operative in the Netherlands for the testing of flexible ducts. This norm gives methods for the defining of the contribution to fire transmitting and the method to the defining of the degree of smoke development, caused by the duct in case of a fire. In 1996 the **NEN 3883** has been split up into **NEN 6065** and **NEN 6066**.
NEN 6065 describes the testing methods for the defining of the flame transmission and the contribution to spreading of the flames. **NEN 6066** describes the testing methods for the defining of the smoke production.

7.2.1. SPREADING OF THE FLAMES
For the defining of the spreading of the flames a sample of the test material will be exposed to the heat of radiation, in such a way that the incident radiation will flow over the surface of the sample in a special direction. At the same time on the place of the greatest radiation intensity a gas flame of a certain dimension will make contact with the sample. The distances over which the flames will move during the first 10 minutes are representative for the spreading of flames of the testing material. This distance will be translated into a flame spreading class.

7.2.2. FLASH OVER OF THE FLAMES
To the defining of the contribution to the flashing over of the flames two samples of the testing material will be arranged vertically and parallel to one another in a testing cabinet. By means of electrical spiral filaments so much warmth will be added to the cabinet, that flame spreading might occur. The electric energy flow, occurring after some time, are representative for the contribution to flame spreading from the tested side of the material. The materials will be divided into classes during these tests referring to the way the material comes out of the test.

7.2.3. SMOKE NUMBER INSULATION MATERIALS
The smoke development of an insulation material is explained in the (**smoke number**) (**R**). According to **NEN 3881**:

R < 5	weak smoke development
5>R < 60	moderate smoke development
60>R<150	strong smoke development
R>150	very strong smoke development

The degree of toxicity of gases, given off in case of a fire, has been defined according to a norm.

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7.0 FIRE SAVETY OF FLEXIBLE DUCTS

7.3 UNITED KINGDOM
In the United Kingdom three different test methods are applicable to flexible ducts. These three methods are described in one standard: **BS 476 (BS = British Standards)**. This standard has been divided into more paragraphs, where the paragraphs 6, 7 and 20 are applicable to flexible ducts.

7.3.1. BS 476 part 6
The method, described in **part 6** gives an indication about the amount of energy, released by an increasing of the temperature. This method shows how much the contribution of energy is in case of a fire. During this test a sample will be heated in an oven and the amount of combustible gases, released out of the material, will be measured. The measurement data are controlled with the data of an incombustible material.

7.3.2. BS 476 part 7
The **BS 476 Part 7** is comparable with the dutch **NEN 6065**. Here the products are also divided into classes, the lower the class number the less combustible gas will be released out of the product.

7.3.3. BS 476 part 20
The purpose of **BS 476 part 20** is to observe the properties of a flexible duct in order to prevent that the fire in the duct will be moved from the inside to the outside. The duct has to keep the fire as long as possible inside, in order to prevent the surroundings of the duct to get on fire. The velocity of spreading of a fire in a building depends among other things on this property.
During the test in **part 20** an air flow of heated gases, arouse in a hot-air oven, will be lead through a duct in the same way as a fire would move. The temperature of the gas is determined in the **BS 476 part 20**. The test will be stand if the duct (hose) will not produce any holes or spontaneous combustion after 15 minutes. In the report delivered by the testing authority has been stated when exactly this happens. For **DEC INTERNATIONAL®** laminate ducts this happened between 20 and 30 minutes. So the test was stand without any problems.

7.4 GERMANY
In Germany a great range of tests are applicable to the fire safety or flexible tests, we will describe the most important ones. The German standard for these tests is **DIN 4102**. In Germany the fire class have been divided in two classes: A and B.

7.4.1. CLASS A
The A-class points to the combination of the elements. A product from the **A1 class** has been built up out of incombustible elements. A product with an **A2** classification has been built up out of combustible and incombustible elements.
The tests belonging to this class contain among other things a flame-spreading test. The **A-class** has a control-contract as well. If a product has been tested and classified a contract has to be fixed with the controlling authorities. This authority controls by means of a yearly sampling test wether the product still comes up to the requirements. The inspection will be unannounced and therefore very objective. Each product type will get its own certificate number, this number has to be attached to the product.

7.4.2. CLASS B
Within the B-class the following difference will be made:
B1 = hardly combustible
B2 = not easily combustible
B3 = easily combustible
The division of the product will be made according to a few, e.g. spreading of the flames.

7.4.3. TOXICITY
If a duct burns is not only the combustibility of the duct important but also the combination of the smoke. In Germany the combustion products of the **ALUDEC 112** have been tested on toxicity. The combustion gases have been classified into the category: "**Unbedenklich**"

7.5 FRANCE
In France the flexible ducts have been tested according to the standard **NF P92-501/509**. The sample will be tested in different ways, according to the thickness. During the tests the spreading of the flames and the energy, which will be released, will be tested. According to these data a product will be classified into a M1 class. The M class ranges from M0 up to and including M5. M0 is the best class, in several French building projects the ducts, which are prescribed, have to conform to the class M0 or M1.
The dividing will be made according to the spreading of the flames.
The **DEC INTERNATIONAL®** products have been tested in France by **CSTB/LNE**.

7.6 AUSTRIA
Austria has, just like Germany, the **fire classes A and B**. The A-class has not been divided, but stays just A. If the product does not burn up at a 750°C temperature it comes up to the classes.
The **B class** has also like in Germany, been divided in the categories **B1, B2 and B3**. The standards for this division and the accompanying test methods have been fixed in the Austrian standard: **Önorm 3800**. The products will be tested, among other things, on spreading of the flames, smoke density and dripping.

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8.0 PROJECTS

DEC INTERNATIONAL®s complete programme has been prepared in such a way that it will be useful under al circumstances. Therefore DEC could open branches world wide. All-round utility is understood by the **DEC technicians**. The flexibility of the product range and the flexible attitude of the **DEC employees** assures that **DEC** is able to work in many different areas. In this chapter we will give you a compendious survey of our projects in various countries.

AUSTRIA:
- Ares Tower Vienna
- Office park Airport Vienna

BELGIUM:
- Alhambra Brussels
- All Suite Hotel Brussels
- Blue Tower Brussels
- Charlemagne Brussels
- Crédit Lyonnais Brussels
- EEC Building Brussels
- Eurosqurie Brussel
- General Hospital Klina Brasschaat
- Innogenetics Gent
- Investissement Foncier Hulpe Brussels
- Les Communautés Brussels
- Montbourg Brussels
- Museum of Arts Gent
- Phoenix Brussels
- Procter and Gamble building Strombeek
- Tenneco Zaventem
- Zaventem Airport Brussels

BULGARIA:
- American Embassy Sofia
- Japanese hospital "Tokuda" in Sofia Vlagoklima Ltd
- "Ultra marine" modern complex of office buildings and appartment flats in Varna
- Bioklima A&R

CHINA:
- Airport Beiijng

GERMANY:
- Airport Munich
- Airport Frankfurt
- Westhafen Tower
- Bulgarian Embassy Berlin

GREECE:
- Hyatt Hotel (Salonica)
- Monastery of Lazarines
- Macedonia building (Athens)
- Shelman building (Athens)
- Goulandris Museum of History of Nature
- Athens Academy building
- Cosmote building (Athens)
- Panafon building (Athens)
- New Sparta Airport
- Onassis Heart Surgery Hospital

HONG KONG:
- Apple Daily Post (Tsueng Kwan Workshop)
- Air Cargo Terminal
- Bank of America
- Cathay Pacific Catering Services
- Central Plaza Renovation
- Chai Wan T. I.
- China Fleet Club
- District Court Harbour Road
- Exchange Square Phase I
- Exchange Square Phase II
- Finance Building
- Financial Building
- Grand Hyatt Hotel Renovation

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8.0 PROJECTS

- H-6 Project
- Hartcourt House
- Happy Valley Grandstand II
- H.K. Convention & Exhibition Centre
- H.K.U. Office 3/F, Admiralty Centre
- H.K.U. of Science & Technology
- H.K.U. of Science & Technology Phase II
- Hong Kong Shanghai Bank Building
- Hong Kong Country Club
- HSBC-Headquarters
- HSBC-664 Nathan Road
- Kai Tak Airport Terminal
- Kai Tak Cargo Terminal
- KCR House
- Luk Kwok Centre
- Macau Cultural Centre
- Man Kam To
- Melbourne House Renovation
- Ngau Chi Wan Market
- N KIL 5909
- N0.9 Queen's Road Development
- Oxford House
- Pacific Phase I
- Pricewater House
- Queensway Government Office
- Ritz Carlton Hotel
- Satin Race & Jockey Club
- Shanghai Pudong International
- Shanghai Hong Qiao Hotel China
- Shenzhen New Overseas Hotel China
- Silver Bay Redevelopment
- Standard Chartered Bank
- Standard Chartered Bank 31/F TO 35/F Renovation
- Tsing Shan Wan Eng. Centre
- T.S.T. Gateway Phase 2 & 3
- Tsuen Wan Govt. Office
- Tsueng Kwan O Area 59 Phase 7
- Tuen Mun Cultural Complex
- Tuen Mun Cultural Complex II
- Wang Tau HOM Phase 12
- Western Urban Council Complex
- World Bank Conference 1997

ITALY:

- Acquario Genova
- Aeroporto Capodichino Airport Napoli
- American Hospital Roma
- Bambino (children's) Hospital Roma
- BNL Bank Roma
- Boheringer Mannheim Offices Monza
- Bolonga Airport Bologna
- Bristol Myers Squibb Pharmaceutical Industry Sermoneta
- Central Railway Station Napoli
- Centro Commerciale Shops Firenze
- CNR Experimental Centre Milano
- CRN Offices Napoli
- Croce Rossa Italiana Offices Venezia
- Della Valle Offices and Factory Massa Carrara
- Divani & Divani Showroom Roma
- Elasis Electronic Industry Napoli
- Emporio Armani Showroom Roma
- Hilton Hotel Milano
- Hospital Trento
- Hotel Congressi Roma
- Hotel Massimo d'Azeglio Roma
- Humanitas Hospital Milano
- I.S.I. S. Antino Laboratories Napoli
- IBM Offices Roma
- IFIS Industry Caserta
- Il Sole 24 ore Offices Milano
- IPER Coop Shops Afragola Napoli

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8.0 PROJECTS

- Jean Louis David Showroom Roma
- Malpensa 2000 Airport Milano
- McDonald's Fast food Restaurants various locations
- Ministero Interni Roma
- Palazzo della Regione Cagliari
- Palermo Airport Palermo
- RAS Offices Milano
- Roma Airport
- S. Pietro Hospital Roma
- SGS Thomson Catania
- Sirte Conference Rooms Lybia
- Soc. Autostrade Offices Roma
- Telecom Italia Roma
- Universita Cattolica Milano
- Villaggio Valtur Holiday Resort Catanzaro
- Vitro Ciset Offices Roma

JORDAN:

- Dutch Embassy

NETHERLANDS:

- Technical University, faculty of mining
- Schiphol Airport Amsterdam
- Zestienhoven Airport Rotterdam
- Amsterdam Arena (Stadium A.F.C. Ajax)
- Weena building Rotterdam
- Rabo bank Eindhoven
- Rabo bank Rotterdam
- Rabo bank Utrecht
- ING bank Amsterdam
- Philips building
- Roka Energy plant Rotterdam
- PEN Energy plant Alkmaar
- PNEM Energy plant Geertruidenberg
- Music school Eindhoven
- Dutch Railway Co. Headquarters Utrecht
- Congress centre Eindhoven
- Office building Willems shipyards Rotterdam
- Computer centre Ministry of Defence de Lier
- Computer centre municipal hall Rotterdam
- Nationale Nederlanden (Insurances) Headquarters Rotterdam
- Delta Lloyd Main office Rotterdam
- Sky tower Rotterdam
- University Leiden
- Municipal Library Rotterdam
- Technical University, faculty of electrical engineering
- National Air and Space Laboratory Emmeloord
- Academic Hospital Utrecht
- Academic Hospital Leiden
- World Trade Centre Amsterdam
- Institute of veterinary science Lelystad
- Casino Breda
- Casino Den Haag
- Casino Zandvoort
- Airport Zuid-Limburg Beek
- Exchange building Rotterdam
- Hospital Enschede
- Hospital Delft
- Hospital Alkmaar
- Hospital Zoetermeer
- Jail house Zoetermeer
- Office building PTT (national postal services) Den Haag
- Office building PTT (national postal services) Groningen
- Main distribution centre PTT (national postal services) Rotterdam
- Main building Gasunie Groningen
- Royal Palace Noordeinde Den Haag
- Millenium Tower Amsterdam

POLAND:

- Merkury Hotel Poznan
- The Warsaw Stock Exchange

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8.0 PROJECTS

- Carrefour Supermarket Wroclaw
- Géant Supermarket "Korona" Entertainm. Shopping Centre Wroclaw
- Volkswagen Manufacturing Poznan
- Petrol Stations Wroclaw
- Sewage Treatment Plant Gdansk
- Radio Studio Wroclaw
- Television Studio Wroclaw
- Coal mine Belchatów
- Ahold Supermarket Rzeszów
- Szalony MAX Supermarkets Krosno en Nowa Sól
- One-family House Olawa
- National Museum

RUSSIA:

- Kremlin
- Moscow Offices
- Ulansky Center
- Riverside Towers Moscow
- Expocentre Moscow
- White House Moscow
- Parliament House Moscow
- UPDK Complex Moscow
- Gazprom Moscow
- Tverskaya Hotel Moscow
- Tverskaya Business Center Moscow
- Vatutinki Hotel Moscow
- Petrograd Hotel St. Petersburg
- Military Houses Baranowitschi
- Military Houses Kiev
- Maternity Hospital Moscow
- Mosenka Hospital Moscow
- Lazurnaya Hotel Soci
- RCC Project
- Kaluga Bank
- Krasnoyorsk Project
- Tschist Project
- Kabardinka Hotel
- GPV Housing Project
- Airport Shermetyevo Moscow
- Airport Domededova, Moscow
- Hotel Ukriana, Moscow
- Airport Pulkovo St.Petersburg
- Winterpalace, Hermitage St.Petersburg
- Hotel Astoria St.Petersburg

SPAIN:

- Department stores "El Corte Ingles" Spain
- Torre Picaso Madrid
- Edificio Mapfre Barcelona
- Airport Barcelona
- Airport Madrid
- Sant Pau Hospital Barcelona
- Regional Hospital Blanes
- Regional Hospital Mataró
- Cultural Forum Barcelona
- Torre Agbar – Barcelona
- An infinite number of offices and commercial centres Spain

SWEDEN:

- Airport Gardemoen Oslo
- Kvaerner Masa Shi
- Café Opera Stockholm

SWITZERLAND:

- Kloten Airport Zürich
- Skyguide Dübendorf
- Messetum Basel
- Diax Tower Zürich

SERBIA, MONTENEGRO, FRo MACEDONIA:

- Ministry of internal affairs(Banjica);

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8.0 PROJECTS

- Student Campus;
- Embassy of Canada;
- Embassy of Portugal;
- Embassy of USA;
- Embassy of UK;
- Yugoslav Drama Theatre,
- Belgrade Drama Theatre;
- Terazije Theatre;
- Madlenianum Theatre;
- Parliament of Serbia and Montenegro;
- Hidrometereological bireue.
- Parliament of Vojvodina – Novi Sad ;
- Clinical Centre-Nis
- Hotels:Belgrade; „Slavija" , „Srbija" , „Mladost" ;„Tadz"Novi Pazar; „Moravica" – Soko Banja; „Bern"Struga; „Neda-Zamit" – Rudnik; „Montenegro" – Becici; „Tis" – Zajecar;
- Banks: Beograd; „Zepter Bank", „Delta Bank", Exim Bank", „Nacional Bank of Greece", „AIK Bank" „Air Bank" – Kragujevac; „Bank of Cacak" – Gornji Milanovac; „Delta Insurance" – Nis; „Delta Bank" – Nis; „Nacional Bank of Greece"Nis; „Aik Bank" – Nis; „Delta Bank"Pancevo; „Exim Bank"Zajecar; „National Bank of Greece"Krusevac; „National Bank of Greece"Pozarevac; „Nacional Bank of Greece"Subotica; „Nacional Bank of Greece"Cacak; „Nacional Bank of Greece"Vranje; „Nacional Bank of Greece"-Zrenjanin
- Restaurants: Belgrade; „Srpski konak" , ,,Pink" , „Molen" „Porto"; „Dvor" Novi Sad
- Companies: Belgrade; „Pionir" ,Maxi Discount (about 20 objects); Super markets: „Veropulos", „ Merkator"; car shop „Verano Motors, Tenis club „Djukic", „Mobte; 063" ; house of fashion"Legend" ; department store „Big bull" ; new trade centre „ in Makedonska 32 street ; „Plenet" ; „Milenijum" ; „Tera Nova" ; „RTS" ; „B92" ; „GTC"; health centre „Vracar"; health center „Zvezdara"; Committee for protection of life enviroment ; KBC "Bezanijska kosa' ; KBC "Dragisa misovic"; Filharmony of Belgrade, Airport; „Knjaz Milos" –Arandjelovac; „Protein"Becej; „Pionir –Mega Market"Subotica; Mega market „Rodic" – Indjija; Tabacco factory „Monus" – Indjija; „McDonalds"Podgorica – „Hemofarm Engeneering" – Podgorica; „Telecom Monetenegro"Podgorica; „McDonalds"-Budva; „Mip"-Pancevo; „Medela" – Vrbas; „Boja"-Sombor; „Tehnomat"Novi Sad; „RTS"Novi Sad; „MB Braca Roric" BreweryNovi Sad; Clinical Centre-Novi Sad; „Marbo product"Novi Sad; „Metalac"-Gornji Milanovac; "Visol"-Cacak; „Kolubara"-Vreoci; „Heba"-Bujanovac; „Hemofarm Engeneering"Vrsac; „Juhor"-Jagodina; „Somboled"-Sombor;"Building of the Police"-Valjevo
- Others objects:Blocks of flats L1-L5 (Bezanijska kosa) ; stadium „Obilic" ; TV studi „Pink"; TV studio Vrsac ; Hall of sports: Belgrade arena" ; cement plant "Popovac", cultural and trade center „Sava Centre" ;

SOUTH KOREA:

- The Blue House Presidential Residence
- The National Assembly Building
- Building Assembly Hall
- Public Prosecutors Office Building
- Central Government Building
- Pusan Local Government Building
- Pundang Local Government Building
- Diplomacy Center Building
- National Assembly constitutional government memorial Center
- Concert Hall of Art
- National Central Museum
- National Korean Music Hall
- Korean Broadcasting System
- International Broadcasting System
- Seoul Broadcasting System
- Buddhism Broadcasting System
- Christian Broadcasting System
- Peace Broadcasting System
- Lotte Department Store
- Shinsegyue Department Store
- New Core Department Store
- LG Department Store
- Grace Department Store
- Lotte Hotel
- Intercontinental Hotel
- Kal Hotel
- Grand Hotel
- Olympia Hotel
- Paradise Hotel
- Seoul University General Hospital Polyclinic
- Samsung Medical Institution
- Kumi Medical Center
- Korean Communication Center
- Seoul Communication Center
- Korean Public Energy Corporation

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8.0 PROJECTS

- Kwangyang Iron Mill
- Pohang Iron Mill
- Samsung Semiconductor Center
- Samsung Electron Building
- Samsung Life Building
- Samsung Motor Center Building
- Hyundae Security Building
- Asiana Airline Building
- The Bank of Korea
- Korea Hanmi Bank
- Branch of Chase Manhattan Bank
- Jungang Ilbo Newspaper Building
- Kukmin Ilbo Newspaper Building
- Asem World Trade Center Building
- Incheon International Airport
- various Subway stations

TURKEY:

- Demirbank
- Kempinski Hotel
- Çiracan Palace Istanbul
- Swiss Hotel Bosphorus Istanbul
- Movenpick Hotel Istanbul
- Hilton Conrad Hotel Istanbul
- Akgûn Hotel Istanbul
- Penta Hotel Istanbul
- Holiday Inn Istanbul
- Hyatt Regency Hotel Istanbul
- Sultanahmet Hotel Istanbul
- Sabanci Business Center Istanbul
- Akmerkez Istanbul
- Çamlica Business Center Istanbul
- Üçem Business Center Istanbul
- Esbank HQ Istanbul
- Türk Ticaret Bankasi HQ Istanbul
- Milli Reasürans Binalari Istanbul
- Mustafa Nevzat Factory Istanbul
- Roche Factory Istanbul
- Eczaciba□i Factory Istanbul
- Milliyet Newspaper Istanbul
- Istanbul Stock Exchange Istanbul
- Lapis Business Center Istanbul
- Ca□alo□lu Hali Sarayi Istanbul
- Barboros Hotel Istanbul
- Anadolu Endüstri Holding Merkez Bina Istanbul
- Istanbul CNR Istanbul
- Migros Galleria Istanbul
- Arçelik Çayirova Factory Istanbul
- Üçem Plaza Istanbul
- Sinai Yatirim Bankasi Istanbul
- Esbank Istanbul
- Yapi Kredi Bankasi HQ Istanbul
- Demirbank HQ Istanbul
- Korteks Business Center Istanbul
- I□bankasi HQ Istanbul
- Istanbul Tekstilciler Merkezi Istanbul
- Osmanli Bankasi Istanbul
- Inco Business Center Istanbul
- Four Seasons Hotel Istanbul
- Arçelik Engineering Building Gebze
- Arçelik HQ Gebze
- Emlakbank Yahya Kaptan Konutlari Izmir
- Hilton Hotel Izmir
- Büyük Efes Hotel Izmir
- Eylul Universitesi Izmir
- Reynolds Sigara Fabrikasi Izmir
- Philsa Philip Morris Sabanci Sigara Fabrikasi Izmir
- Migros/Balçova Izmir
- Karum Business Center Ankara
- An Tubitak Binalari kara
- Emlabank Elvankent Konutlari Ankara

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8.0 PROJECTS

- Aselsan Elektrooptik Fabrikasi Ankara
- Başari Elektronik Fabrikasi Ankara
- Halk Bankasi HQ Ankara
- Ankara Alüminyum Ankara
- Metro Grosmarket Bursa
- Tofa□ Idare Binasi Bursa
- Ramada Hotel Mersin
- Migros Adana
- Club Hotel Sirene Antalya
- Club Mega Saray Antalya
- Zeynep Hotel Antalya
- Mega Kiri□ Hotel Antalya
- Lapis Serbest Bölge Tesisleri Antalya
- Lapis Çimtur Tesisleri Antalya
- Perge Turistik Sati□ Tesisleri Antalya
- Lapis Tesisleri Selçuk
- Robinson Club Fethiye
- Hapimag Hotel Bodrum
- Arttek Marmaris Hotel Marmaris

UNITED KINGDOM:

- Gatwick Airport London

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9.0 CHEMICAL RESISTANCE

ALUMINIUM FOIL

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID				•								
ACETONE			•									
ACETYLENE			•									
AMMONIA			•									
BENZENE			•								•	
BROMINE			•								•	
BUTANE			•									
CARBON DIOXIDE			•							•		
CHLORINE			•								•	
ETHENE												
FORMALDEHYDE				•								
HELIUM			•									
HYDROGEN			•									
HYDROCHLORIC ACID												
METHANE			•									
METHANE CARBOXYLIC ACID												
METHANOL												
METHYL BENZENE												
NEON			•									
NITRIC ACID					•							
NITROGEN			•									
OZONE				•								
PHENOL				•								
PHOSPORIC ACID					•							
PROPANE			•									
SULPHUR			•									
SULPHURIC ACID					•							
SULPHUROUS ACID				•								
TOLUENE			•									
WATER				•								

S = Superior
E = Excellent
G = Good
F = Fair
P = Poor
NR = Not recommended

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9.1 CHEMICAL RESISTANCE

COATED FABRICS (GREYDEC)

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID												
ACETONE						•						•
ACETYLENE		•						•				
AMMONIA SOLUTION				•						•		
AMMONIA CONCENTRATED				•						•		
BENZENE						•						•
BROMIDE			•						•			
BUTANE		•						•				
CARBON DIOXIDE	•						•					
CHLORINE	•						•					
ETHANE		•						•				
FORMALDEHYDE												
HELIUM	•						•					
HYDROGEN	•						•					
HYDROCHLORIC ACID		•						•				
METHANE		•						•				
METHANE CARBOXYLIC ACID			•						•			
METHANOL				•						•		
METHYL BENZENE				•						•		
NEON		•						•				
NITRIC ACID			•						•			
NITROGEN	•						•					
OZONE			•						•			
PHENOL			•						•			
PHOSPORIC ACID 30%			•						•			
PROPANE		•						•				
SULPHUR	•						•					
SULPHURIC ACID 50% SOLUTION		•						•				
SULPHUROUS ACID 30% SOLUTION		•						•				
TOLUENE						•						•
WATER	•						•					

S = Superior
E = Excellent
F = Fair
G = Good
P = Poor
NR = Not recommended

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9.2 CHEMICAL RESISTANCE

POLYESTER FOIL

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID												
ACETONE		•						•				
ACETYLENE		•						•				
AMMONIA SOLUTION					•						•	
AMMONIA CONCENTRATED						•						•
BENZENE		•						•				
BROMINE		•						•				
BUTANE		•						•				
CARBON DIOXIDE		•						•				
CHLORINE		•						•				
ETHENE		•						•				
FORMALDEHYDE												
HELIUM		•						•				
HYDROGEN		•						•				
HYDROCHLORIC ACID				•						•		
METHANE		•						•				
METHANE CARBOXYLIC ACID		•						•				
METHANOL		•						•				
METHYL BENZENE		•						•				
NEON		•						•				
NITRIC ACID				•						•		
NITROGEN		•						•				
OZONE			•						•			
PHENOL			•						•			
PHOSPHORIC ACID 30%		•						•				
PROPANE		•						•				
SULPHUR			•						•			
SULPHURIC ACID 50% SOLUTION				•						•		
SULPHUROUS ACID 30% SOLUTION				•						•		
TOLUENE												
WATER	•						•					

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9.3 CHEMICAL RESISTANCE

PVC

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID						•						•
ACETONE												
ACETYLENE												
AMMONIA SOLUTION		•										
AMMONIA CONCENTRATED						•						
BENZENE						•						•
BROMINE						•						•
BUTANE		•						•				
CARBON DIOXIDE		•						•				
CHLORINE												
ETHENE												
FORMALDEHYDE												
HELIUM												
HYDROGEN		•						•				
HYDROCHLORIC ACID		•						•				
METHANE												
METHANE CARBOXYLIC ACID												
METHANOL												
METHYL BENZENE												
NEON												
NITRIC ACID			•						•			
NITROGEN	•						•					
OZONE		•						•				
PHENOL						•						•
PHOSPORIC ACID 30%			•						•			
PROPANE			•						•			
SULPHUR												
SULPHURIC ACID 50% SOLUTION		•						•				
SULPHUROUS ACID 30% SOLUTION			•						•			
TOLUENE	•						•					
WATER	•						•					

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9.4 CHEMICAL RESISTANCE

ASB TAPE

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID				•						•		
ACETONE			•						•			
AMMONIA			•							•		
BENZENE			•								•	
BROMINE					•						•	
BUTANOL			•						•			
CARBON DIOXIDE			•							•		
ETHANOL			•						•			
FORMALDEHYDE				•						•		
HELIUM			•						•			
HYDROGEN			•						•			
HYDROCHLORIC ACID					•						•	
METHANOL			•						•			
NITRIC ACID UP					•						•	
NITROGEN			•						•			
OZONE				•						•		
PHENOL				•						•		
PHOSPORIC ACID					•						•	
PROPANE			•						•			
SULPHUR			•									
SULPHURIC ACID UP					•						•	
TOLUENE			•						•			
UV RADIATION			•						•			
WATER			•						•			

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9.5 CHEMICAL RESISTANCE

PSB TAPE

	NORMAL CONDITIONS						HUMID CONDITIONS					
	S	E	G	F	P	NR	S	E	G	F	P	NR
ACETIC ACID			•						•			
ACETONE					•						•	
AMMONIA			•							•		
BENZENE					•						•	
BROMINE					•						•	
BUTANOL			•						•			
CARBON DIOXIDE			•						•			
ETHANOL			•						•			
FORMALDEHYDE				•						•		
HELIUM			•						•			
HYDROGEN			•						•			
HYDROCHLORIC ACID			•						•			
METHANOL			•						•			
METHYLENECHLORIDE					•						•	
NITRIC ACID UP TO 30%			•						•			
NITRIC ACID UP OVER 30%				•						•		
NITRIC ACID UP OVER 90%					•						•	
NITROGEN			•						•			
OZONE				•						•		
PHENOL				•						•		
PHOSPORIC ACID			•						•			
PROPANE			•						•			
SULPHUR			•									
SULPHURIC ACID UP TO 70%			•						•			
TOLUENE					•						•	
UV RADIATION				•						•		
WATER		•						•				

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