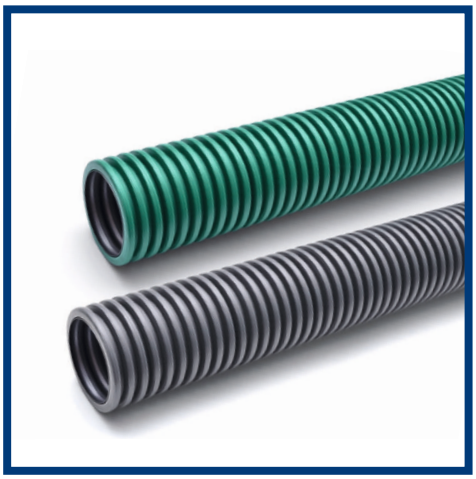
MODERN TECHNICAL IDEA

inGremio®



AIRFLEX SPECTRA-1000
AIRFLEX SPECTRA-1000 HFFR

**ANTIBACTERIAL, ANTIFUNGAL,
ANTISTATIC VENTILATION DUCTS**

SPECTRA
ANTIMICROBIAL PROTECTION FOR POLYMERS

PRODUCTS FOR THE VENTILATION INDUSTRY

The Airflex Spectra-1000 ventilation ducts are used for air transfer in ventilation and recuperation systems in residential, public and industrial buildings.

The internal wall is entirely made of antibacterial and antifungal material, which protects the ducts from colonisation by undesirable and dangerous for people microorganisms. The material of which the ducts are made was developed by Ingremio and is protected by patents. It was created in cooperation with scientific centres in the course of a research project, during which high effectiveness for different types of bacteria and fungi was confirmed. The material contains silver, copper and other microbiologically active compounds in the polymer matrix so that they do not undergo migration, ionisation and elution. The virtual absence of biologically active compounds migration from the polymer has been confirmed in the laboratory tests that were performed in significantly more aggressive environments compared to these of ventilation systems. The substances used ensure in practice an indefinite bactericidal and fungicidal effect and prevent the formation of defensive mechanisms by bacteria and fungi regardless of air temperature and humidity. The composition of the materials used is entirely safe for people, animals and plants. Moreover, all materials used are approved for food contact.

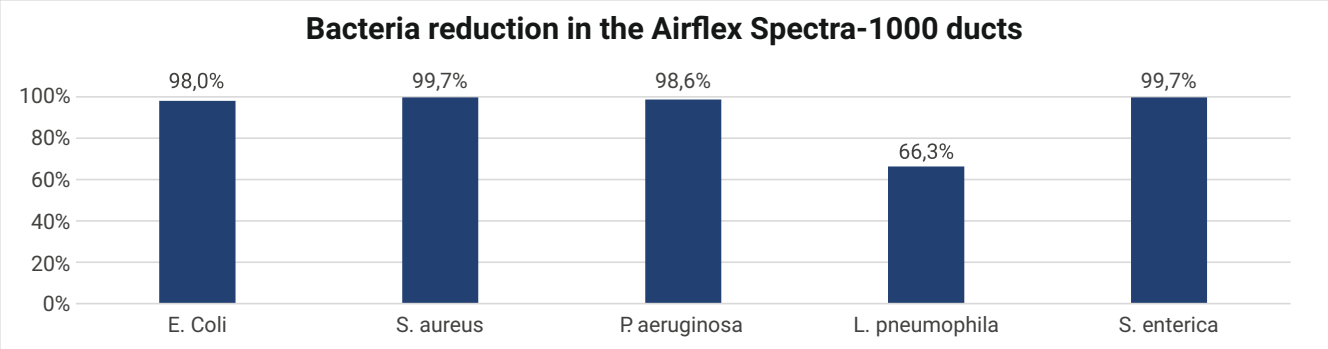
The ducts are characterised by very high flexibility, so that they can be freely shaped, bent at very small radii (according to the permissible bending radii) and adapt to the installation conditions, without the need for additional fasteners and fittings.

The duct structure ensures mechanical compression strength over 500 N, which allows for their pouring over with structural concrete while performing construction works.

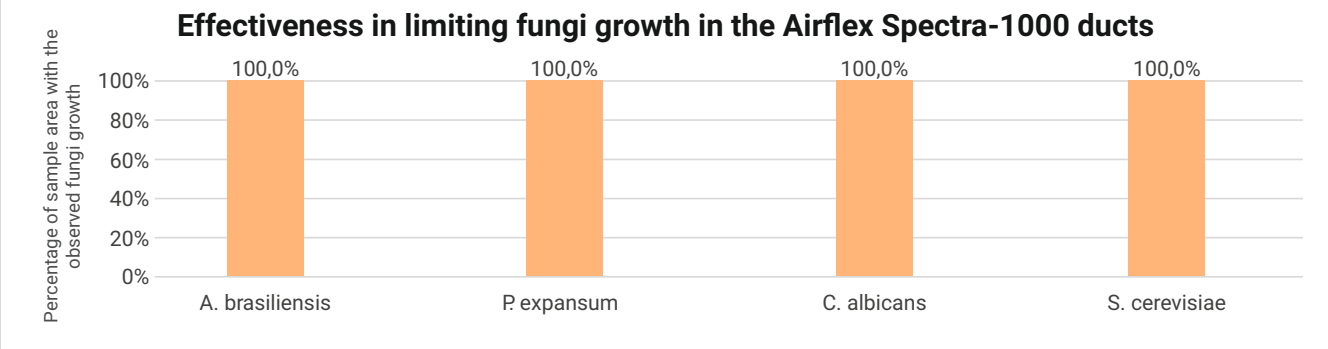
The internal duct wall also has an antistatic effect, which reduces settling and accumulation of dust in the ducts. The smooth internal surface allows for high air flows with low-pressure losses, contributing to the low energy consumption of the entire system. It also makes it easier to clean the ducts if necessary. The double-wall structure of the ventilation ducts with a properly profiled internal wall and closed air voids to a large extent suppresses the entry of noise caused by air flowing inside and thermally insulates.

The Airflex Spectra-1000 ventilation ducts are available in a wide range of diameters, which allows for optimal selection to meet the requirements of the ventilation system and construction conditions. The duct ends are secured and sealed during the production process. The entire coil is protected with foil, which prevents possible contamination during transport and storage.

According to the Regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location, the Airflex Spectra type ventilation ducts should be installed in single-family buildings which are not subject to requirements concerning reaction to fire.



Test of antibacterial properties of the polymer material in a 24 h test. The graph shows the bacteria reduction degree after 24 h contact with the Airflex Spectra sample.

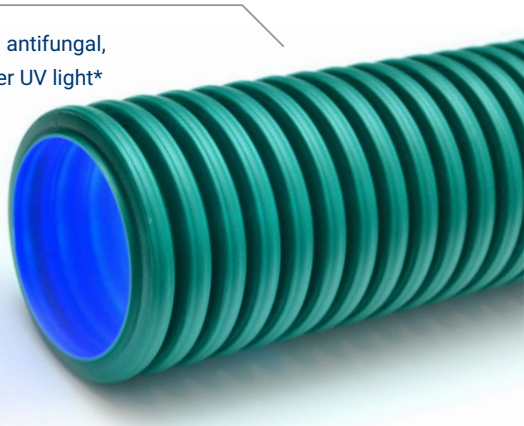


Test of fungistatic properties of the polymeric material in a 28-day test. The presented values may include a deviation resulting from the applied measurement method (0.1%).

> **The antibacterial and fungistatic properties tests were performed according to ISO 22196:2011 and PN-EN ISO 846:2019 in the following accredited microbiological laboratory: Łukasiewicz - Institute for Engineering of Polymer Materials & Dyes/ TB Laboratory in Toruń. The microbiologically active compounds migration test was performed according to PN-EN1186-3:2005 and PN-EN1186-14:2005 standards in J.S. Hamilton Poland accredited laboratory. The reaction to fire tests of the Airflex Spectra-1000 HFFR ducts were performed according to PN-EN 61386-24 standard in accredited Sychta Laboratory. The products hold the PZH Hygiene Certificate.**

AIRFLEX SPECTRA-1000

internal layer: **antibacterial, antifungal, antistatic, fluorescent under UV light***



Reaction to fire class: **flammable duct F** (PN-EN 13501-1:2019-02)
Compression strength: **500N** (PN-EN 61386-24)
Impact resistance: **N** (PN-EN 61386-24)
Longitudinal stiffness: **flexible ducts** (3 x DN PN-EN 13180:2004)
Material: **modified polyethylene** (HDPE-mod.) **approved for food contact**

External layer:

Properties: **high impact strength and mechanical resistance, UV stabilisation - medium**
Colour: **green**

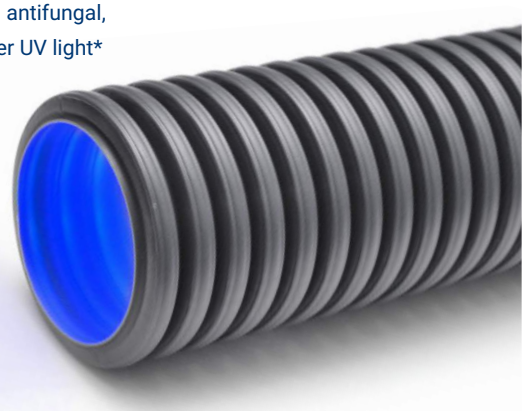
Internal layer:

Properties: **antibacterial layer** (ISO 22196:2011), **antifungal layer** (PN-EN ISO 846:2019), **antistatic layer, extremely smooth surface, fluorescent under UV light.**
Global migration (average): **< 0,5 mg/dm2** (PN-EN 1186-3:2005 and PN-EN 1186-14:2005)
Colour: **silver**

HIGH IMPACT STRENGTH | Ag, Cu, + | ANTIFUNGAL PRODUCT | ANTIBACTERIAL PRODUCT | ANTISTATIC PRODUCT

AIRFLEX SPECTRA-1000 HFFR

duct: **self-extinguishing, halogen-free**
internal layer: **antibacterial, antifungal, antistatic, fluorescent under UV light***



Reaction to fire class: **self-extinguishing duct D-s2,d2** (PN-EN 13501-1:2019-02), **halogen-free (HF)**
Compression strength: **500N** (PN-EN 61386-24)
Impact resistance: **N** (PN-EN 61386-24)
Longitudinal stiffness: **flexible ducts** (3 x DN PN-EN 13180:2004)
Material: **modified polyethylene** (HDPE-mod.) **approved for food contact**

External layer:

Properties: **high impact strength and mechanical resistance, UV stabilisation - medium**
Colour: **silver**

Internal layer:

Properties: **antibacterial layer** (ISO 22196:2011), **antifungal layer** (PN-EN ISO 846:2019), **antistatic layer, extremely smooth surface, fluorescent under UV light.**
Global migration (average): **< 0,5 mg/dm2** (PN-EN 1186-3:2005 and PN-EN 1186-14:2005)
Colour: **silver**

HF HALOGEN FREE | SELF-EXTINGUISHING | HIGH IMPACT STRENGTH | Ag, Cu, + | ANTIFUNGAL PRODUCT | ANTIBACTERIAL PRODUCT | ANTISTATIC PRODUCT

*** The original, patented method of determining the dispersion of microbiologically active components in the polymer allows for immediate verification of the presence of active substances, their dispersion and concentration in the plastic. The UV-illuminated Airflex Spectra ventilation duct evenly fluoresces with blue light for immediate microbiological protection analysis.**

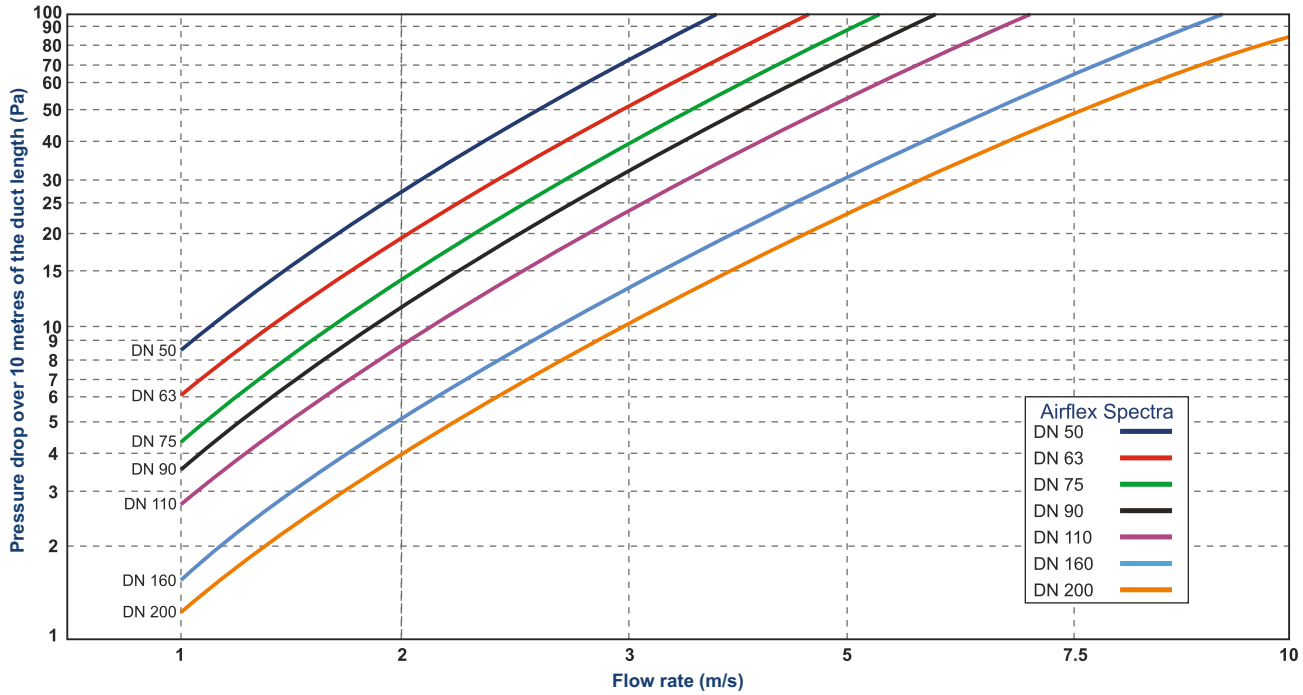
AVAILABLE PIPE DIAMETERS

Nominal dimension DN (mm)	Inner diameter (mm)	Outer diameter (mm)	Minimum bending radius* (mm)	Lengths of sections (mm)
50	40	50,5	0,11	50
63	52	63,2	0,15	50
75	61	76,2	0,17	50
90	75	90,6	0,25	50
110	93	110,7	0,33	50
160	136	161	0,40	25 / 2
200	176	201,5	0,55	25 / 2

* temperature above 10°C

AIR FLOW CAPACITY (m^3/h)

Nominal dimension DN (mm)	Air velocity (m/s)						
	0,5	**1,0**	**1,5**	**2,0**	**3,0**	**4,0**	**5,0**
50	2,3	4,5	6,8	9,0	13,6	18,1	22,6
63	3,9	7,8	11,7	15,6	23,4	31,2	39,0
75	5,3	10,5	15,8	21,0	31,6	42,1	52,6
90	7,8	15,7	23,5	31,4	47,1	62,8	78,5
110	12,2	24,5	36,7	48,9	73,4	97,8	122,3
160	26,1	52,3	78,4	104,6	156,9	209,2	261,5
200	44,0	88,1	132,1	176,2	264,2	352,3	440,4



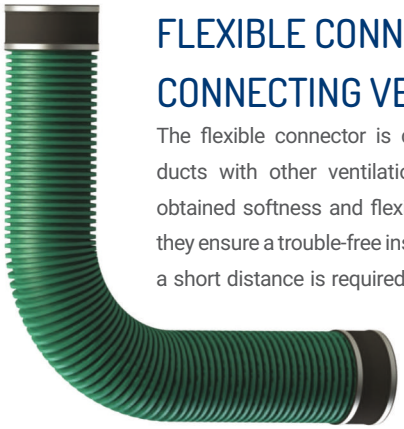
ACCESSORIES

CONNECTORS – MKD

For every Airflex Spectra dimension, the HDPE female connectors in black are available. The female connectors provide a fast, durable and disconnection-resistant duct connection.

RUBBER CONNECTOR – GKD

Female connectors made of black rubber. The female connectors provide a fast, durable and disconnection-resistant duct connection.



FLEXIBLE CONNECTOR FOR CONNECTING VENTILATION DUCTS

The flexible connector is designed for connecting large-diameter ventilation ducts with other ventilation system components. Thanks to the specially obtained softness and flexibility (many times greater than of standard ducts), they ensure a trouble-free installation, where a 90-degree change of direction over a short distance is required. The connectors are available in two sizes: DN 160 and DN200. The set includes a connector and two rubber connection flanges.

GASKETS – UKD

Specially designed gaskets guarantee a tight ducts connection and the system low energy consumption.

CAPS – UKD

The caps protect the ducts from all contamination during transport, storage and installation.

The manufacturer reserve the right to change the parameters due to the improvement and development of the products.

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