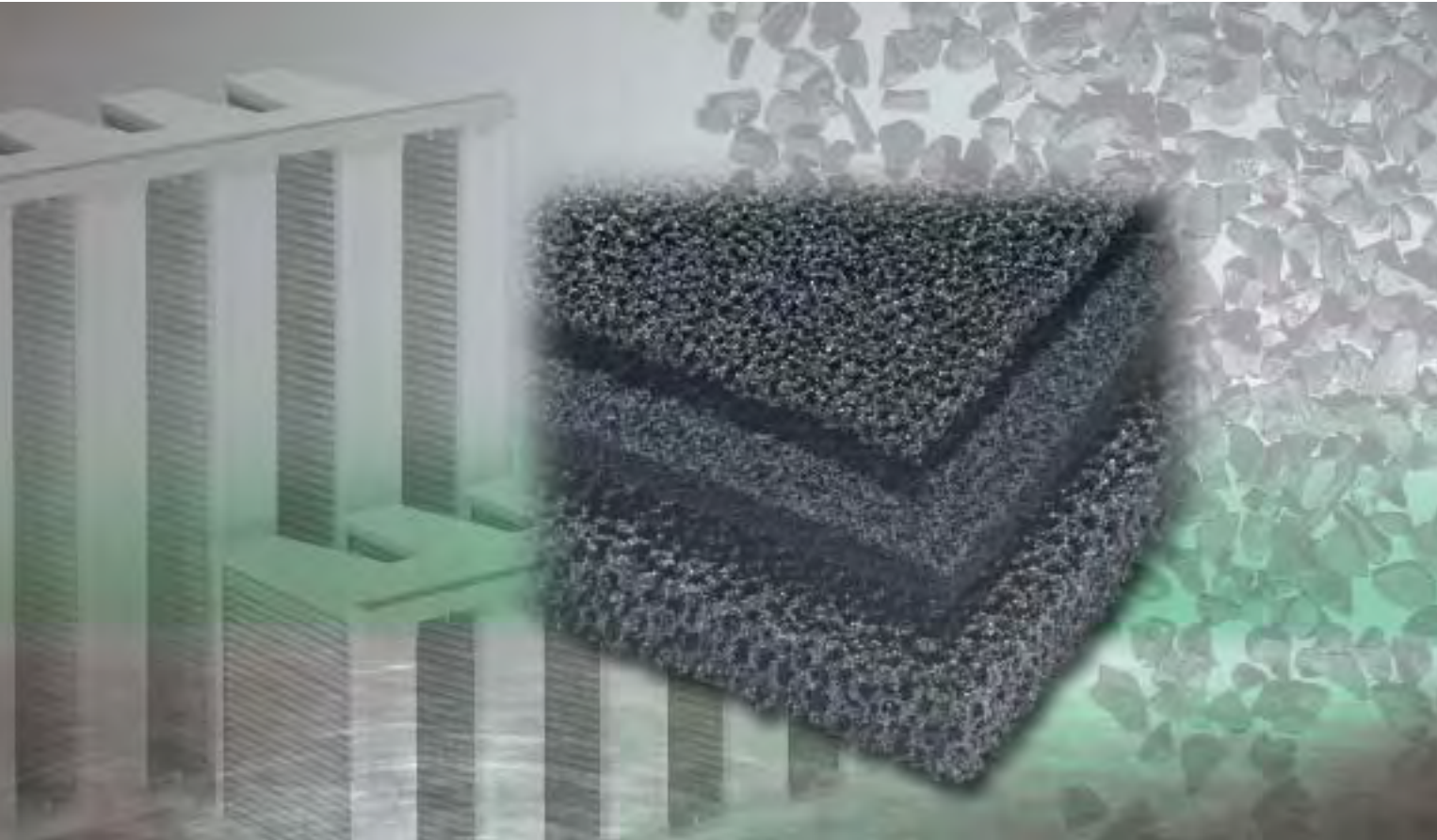




MANN+HUMMEL Activated Carbon Filters



MANN+HUMMEL Activated carbon media ...

MANN+HUMMEL activated carbon media have been providing clean air for people, the environment and industry for many years. They protect people from unpleasant odours or from harmful gases. In production facilities and clean rooms they enhance process reliability and prevent harmful gases entering the environment.

Working closely with industry, MANN+HUMMEL is able to use its products, experience and expertise to find solutions to many filtration tasks. We offer our customers solutions for the adsorption of alkaline or acidic corrosive gases, combined products for gases and particles as well as special solutions with, for example, an anti-bacterial treatment.



Cleaning the circulating air in operating rooms and hospitals



Process air filtration in clean rooms

No application is the same as the next. Accordingly, MANN+HUMMEL fine-tunes its service and product solutions to meet the different requirements of its customers.



Clean air for offices and administration buildings

... clean air for people, the environment and industry

The MANN+HUMMEL product range offers a variety of different activated carbon media. Our standard range of products with various types of activated carbon, varying activated carbon overlays and carrier material thicknesses, with the option of different types of impregnation for some media, can be used to put together customised solutions for your application.

Activated carbon Product overview

- Fabrics coated with activated carbon powder
- Foam coated with activated carbon powder
- Foam coated with granulated activated carbon
- Activated carbon panels
- Filter cells



Application examples in private homes: refrigerators, cooker hoods, vacuum cleaners, garbage cans

Applications	Activated carbon performance characteristics
Clean room technology	Reducing the number of rejected parts Lowering production costs Increase process reliability Improving product quality Avoiding corrosion
Production facilities, air-conditioning and ventilation technology	Protection for people Compliance with workplace environmental exposure limits Reducing emissions and immissions Improvement of air quality
Consumer products and electronic devices *	Reducing odours Lowering energy costs Minimising wear Noise Reduction Environmentally-friendly solution Ozone reduction Regenerative

* e.g. cooker hoods, vacuum cleaners, mobile room air systems, laser copiers, laser printers

Non-woven elements coated with activated carbon powder

Non-woven elements coated with activated carbon powder mainly find use in air-conditioning and ventilation technology, consumer goods and electronic devices.

Media structure:

Voluminous polyester non-woven coated with activated carbon powder.



Performance characteristics:

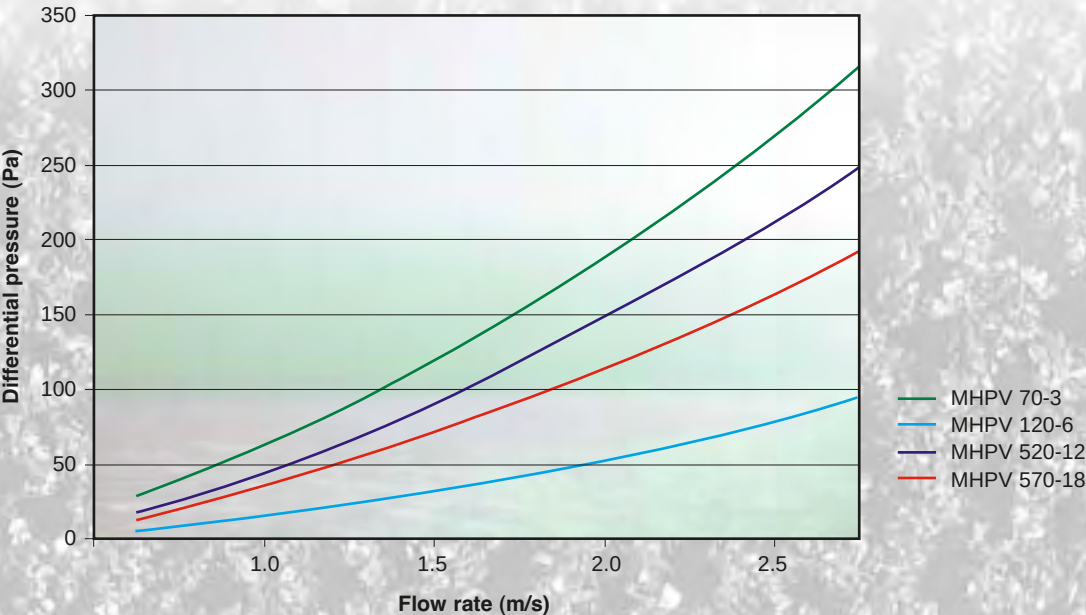
- Different shapes possible
- Partly pleatable
- Available in rolls or cuts
- Impregnated options for adsorption of special gases
- Various differential pressures adjustable by fiber mixtures and compression
- Most economically priced activated carbon medium with standard performance

Specifications **

Media description	MHPV 70-3	MHPV 120-6	MHPV 520-12	MHPV 570-18
Material thickness (mm)	3.0 +/- 0.5	6.0 +/- 2.0	12.0 +/- 3.0	18.0 +/- 3.0
Substrate weight (g/m²)	200	260	1000	1150
Activated carbon weight (g/m²)	70	120	520	570
Differential pressure (Pa) at 0.8 m/s *	< 80	< 20	< 50	< 40

* Standard values tested according to DIN 71460

Differential pressure



Foams coated with activated carbon powder

Activated carbon powder foams are characterised by excellent uniformity and good air permeability. They are especially suitable for use in air-conditioning and ventilation technology, consumer products and electronic devices.

Media structure:

Open-pored polyurethane foam coated with activated carbon powder.

Performance characteristics:

- Multi-layer package available for high performance
- Excellent uniformity regarding air permeability, material thickness and adsorption performance
- Low differential pressure
- Differential pressure can be individually set through varying the distribution of pores
- Flexible shapes possible
- Available in rolls or cuts
- Impregnated options for adsorption of special gases

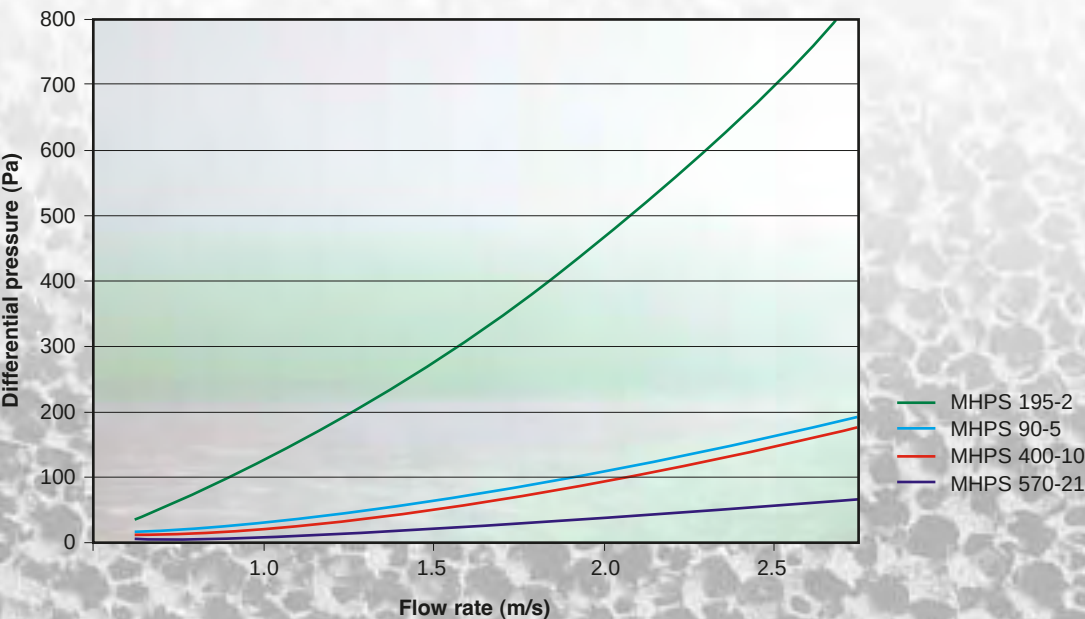


Specifications **

Media description	MHPS 195-2	MHPS 90-5	MHPS 400-10	MHPS 570-21
Material thickness (mm)	2.0 +/- 0.3	5.0 +/- 0.5	10.0 +/- 0.5	21.0 +/- 1.0
Substrate weight (g/m²)	325	240	850	1300
Activated carbon weight (g/m²)	195	90	400	570
Differential pressure (Pa) at 0.8 m/s *	< 100	< 30	< 30	< 20

* Standard values tested according to DIN 71460

Differential pressure



** The listed performance data are based on average values taken from the current production.

Foams coated with granulated activated carbon

Foams coated with granulated activated carbon are high quality adsorption media and can be used in many applications. Typically in air-conditioning and ventilation systems, clean rooms, consumer products and electronic industry.

Media structure:

Open-pored polyurethane foam coated with granulated activated carbon.



Performance characteristics:

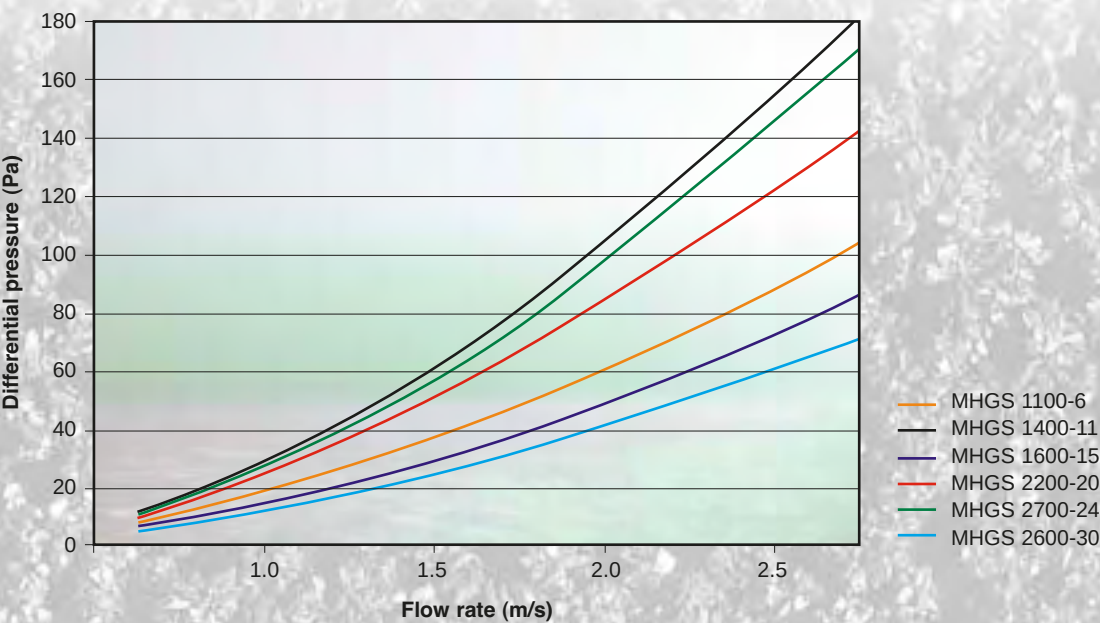
- High adsorption performance
- Combinations available with different media and functions with acidic and/or alkaline impregnation
- Available with or without encasing material
- Multi-layer package available for high performance
- Differential pressure adjustable by porosity of the foam and grain size of the activated carbon granulate
- Media flexible for different shapes

Specifications **

Media description	MHGS 1100-6	MHGS 1400-11	MHGS 1600-15	MHGS 2200-20	MHGS 2700-24	MHGS 2600-30
Material thickness (mm)	6.5 +/- 0.5	11.0 +/- 0.5	15.0 +/- 1.0	20.5 +/- 1.0	24.0 +/- 1.0	30.0 +/- 3.0
Substrate weight (g/m²)	1500	2000	2500	3400	4100	4300
Activated carbon weight (g/m²)	1100	1400	1600	2200	2700	2600
Differential pressure (Pa) at 0.8 m/s *	< 20	< 30	< 20	< 20	< 30	< 30

* Standard values tested according to DIN 71460

Differential pressure



Activated carbon panels

Activated carbon panels are suitable for use in demanding applications such as, in particular, clean room applications and air-conditioning and ventilation systems where the highest filtration performance is required.

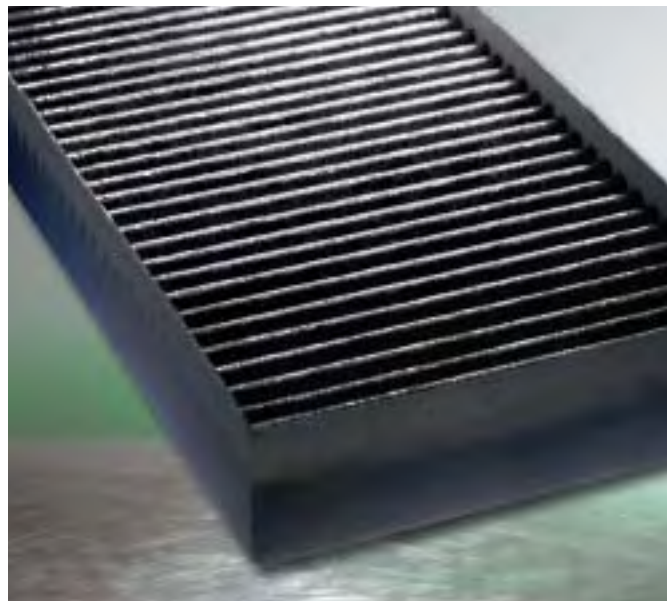
MANN+HUMMEL offers a product range for a wide range of applications.

Media structure:

Polyester non-woven covered with activated carbon granulate, pleated and stabilized with support frame.

Performance characteristics:

- Highest adsorption performance achievable with low differential pressure
- Combination medium available for the simultaneous filtration of gas and particles
- Large filter surfaces possible
- Use of filter element in compact filter cells is possible
- Ideal for rectangular shapes
- Various impregnations available against special gases



Media specifications **

Media description	Gas filter					Combination filter
	MHGV 700-4	MHGV 1000-5	MHGV 1000-5S ²	MHGV 1000-5A ³	MHGV 1000-5C ⁴	MHGV 900-4K
Material thickness (mm)	4.0	5.5	5.5	5.5	5.5	4.0
Activated carbon weight (g/m ²)	700	1000	1000	1000	1000	900
Substrate weight (g/m ²)	850	1150	1150	1150	1150	1050
Differential pressure (Pa) at 0.8 m/s ¹	< 110	< 120	< 120	< 120	< 120	< 130
Filter classes	G2 – G3	G2 – G3	G2 – G3	G2 – G3	G2 – G3	F7

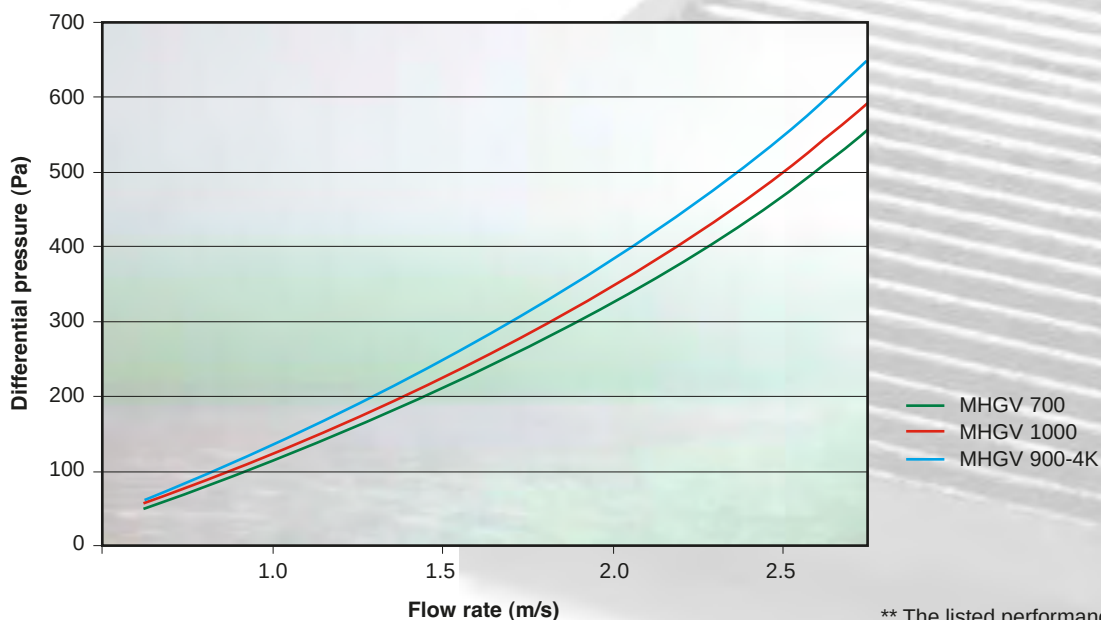
¹ Standard values tested according to DIN 71460

² Impregnated against sulphurous gases

³ Impregnated against alkaline gases

⁴ Impregnated against acidic gases

Differential pressure



** The listed performance data are based on average values taken from the current production.

Compact filter cells for gas filtration



MANN+HUMMEL compact filter cells are proven in the fields of clean room technology, air-conditioning and ventilation systems, as well as in industrial processes. They are chemical adsorption filters suitable for use in technical applications to remove harmful gases and odours from the air. The core of the filter cells are activated carbon panels, as described on page 7.

Depending on the requirements, MANN+HUMMEL offers its customers a wide range of media with or without impregnation.

Filter cell structure:

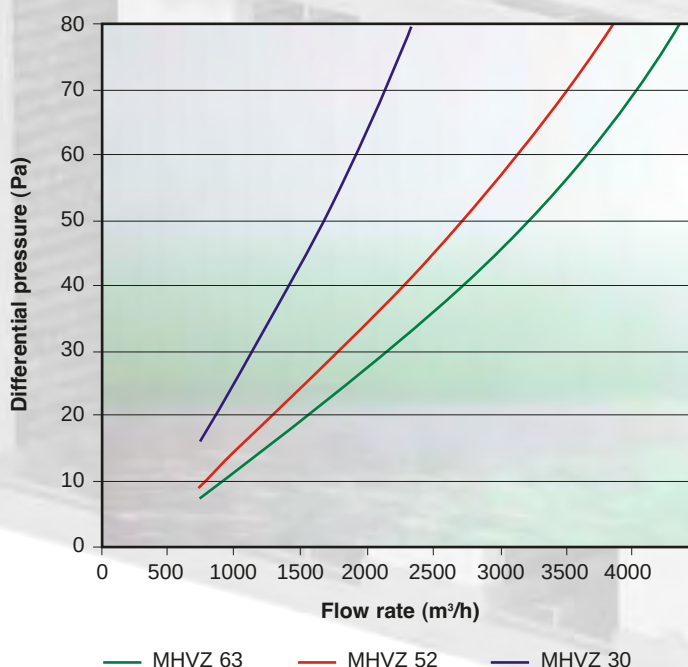
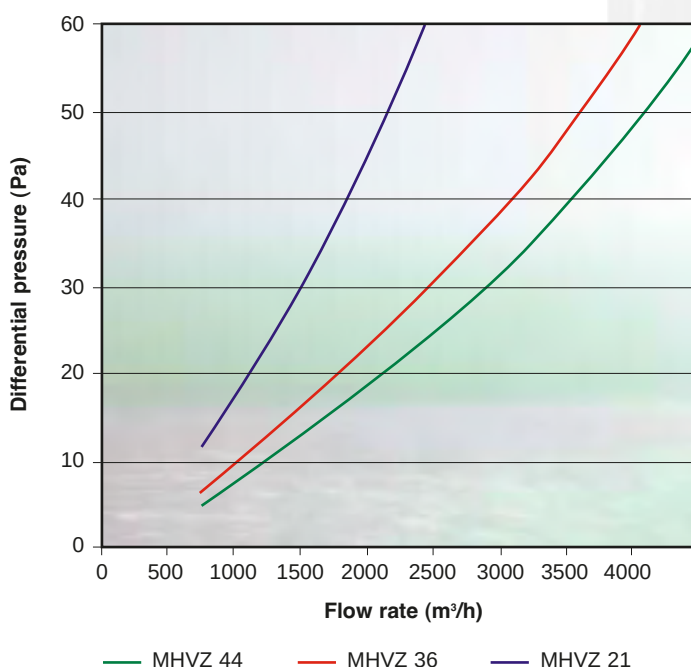
The cell sides are made in polystyrene in various sizes respectively with eight compact activated carbon panels glued into a polystyrene frame (various sizes available).

Specifications **

Description	MHVZ 44	MHVZ 36	MHVZ 21	MHVZ 63	MHVZ 52	MHVZ 30
Size	1/1	5/6	1/2	1/1	5/6	1/2
Dimensions (mm)	592x592x292	490x592x292	287x592x292	592x592x292	490x592x292	287x592x292
Total weight (kg)	9.2	8.3	5.3	11.0	9.9	6.3
Activated carbon weight (kg)	4.4	3.6	2.1	6.3	5.2	3.0
Filter surface (m ²)	6.3	5.2	3.0	6.3	5.2	3.0
Flow rate (m ³ /h)	3400	2700	1600	3400	2700	1600
Differential pressure with above flow rate (Pa) *	40	40	40	60	60	60

* Standard values tested according to DN 71460

Differential pressure



Combination filter for gas and particle filtration

The combination of gas and particle filtration in a single filtration stage is space saving and an economic alternative to two separate filtration stages.

Filter cell structure:

The cell sides are made in polystyrene in various sizes respectively with eight compact activated carbon panels glued into a polystyrene frame (various sizes available).

Typical applications for compact filter cells for gas filtration or combined gas and particle filtration:

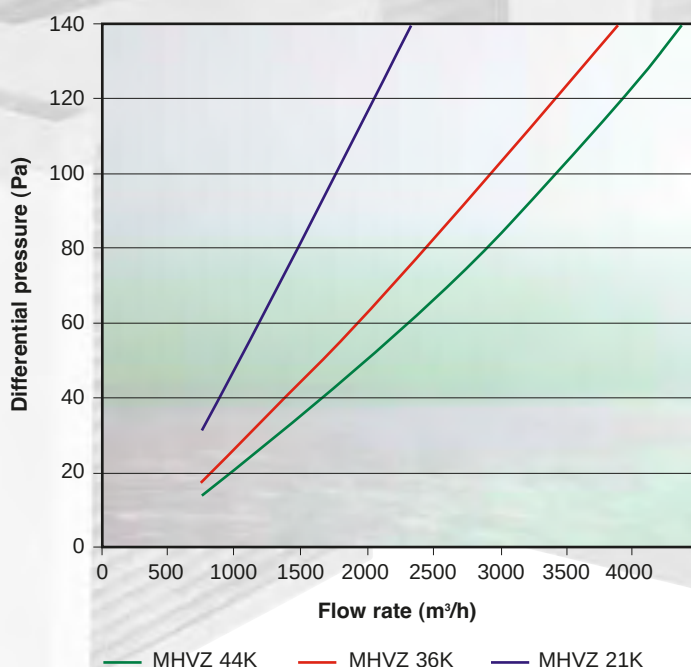
- Air-conditioning and ventilation systems at airports, hospitals, office and administration facilities
- Clean room technology in micro electronics, medical engineering, pharmaceutical and food industry
- Industrial plants such as paper mills, dye factories, paint and welding shops, printworks, dry-cleaning facilities and energy technology

Specifications **

Description	MHVZ 44K	MHVZ 36K	MHVZ 21K
Size	1/1	5/6	1/2
Dimensions (mm)	592x592x292	490x592x292	287x592x292
Total weight (kg)	9.2	8.3	5.3
Activated carbon weight (kg)	4.4	3.6	2.1
Filter surface area (m ²)	5.3	4.3	2.5
Filter class	F7	F7	F7
Dust holding capacity with AC fine (g)	650	540	320
Flow rate (m ³ /h)	3400	2700	1600
Differential pressure with above flow rate (Pa) *	110	110	110

* Standard values tested according to DN 71460

Differential pressure



** The listed performance data are based on average values taken from the current production.

MANN+HUMMEL Industrial Filters worldwide

HEADQUARTERS

MANN+HUMMEL GMBH

Business Unit Industrial Filters
Brunckstr. 15
67346 Speyer, Germany
Tel.: +49 (6232) 53-80
Fax: +49 (6232) 53-88 99
E-Mail: if.info@mann-hummel.com
Internet: www.mann-hummel.com



EUROPE

United Kingdom

MANN+HUMMEL (UK) LTD
Business Unit Industrial Filters
Suite 4, 70 Churchill Square
Kings Hill, West Malling, Kent, ME19 4YU
Tel.: +44 1732 523533
Fax: +44 1732 523534
E-Mail: uk.info@mann-hummel.com
Internet: www.mann-hummel.com/mhuk

France

MANN+HUMMEL FRANCE S.A.S.
Z.I. du Val d'Argent
11, rue Jean Poulmarch
95100 Argenteuil
Tel.: +33 1 30258242
Fax: +33 1 30258259
E-Mail: anne.laurin@mann-hummel.com
Internet: www.mann-hummel.com/mhfr

Italy

MANN+HUMMEL GMBH
Direzione Commerciale Italia
P.O. Box 126, Via Nazario Sauro, 1
23100 Sondrio (SO)
Tel.: +39 0342 2112 70
Fax: +39 0342 2106 90
E-Mail: it.info@mann-hummel.com
Internet: www.mann-hummel.com

Spain / Portugal

MANN+HUMMEL IBERICA S.A.U.
C/ Pertusa n° 8, Polig. Industrial PLA-ZA,
parcela ALI 7,3
50197 Zaragoza
Tel.: +34 (976) 287 300
Fax: +34 (976) 287 418
E-Mail: mhes_fi@mann-hummel.com
Internet: www.mann-hummel.com/mhes

Czech Republic

MANN+HUMMEL (CZ) s.r.o.
Nová Ves č. 66
67521 Okříšky
Tel.: +420 568 898 111
Fax: +420 568 898 314
E-Mail: cz.info@mann-hummel.com
Internet: www.mann-hummel.com/mhcz

Russia

MANN+HUMMEL GMBH
Regional Office
Konenkova Str. 11 A
127560 Moskau
Tel.: +7 095 742 7976
Fax: +7 095 742 7988
E-Mail: oleg.paratnov@mann-hummel.com
Internet: www.mann-filter.ru

MANN+HUMMEL Industrial Filters worldwide

NORTH AMERICA

USA / Canada

MANN+HUMMEL USA, INC.
6400 South Sprinkle Road
Portage Michigan, 49002-8720
Tel.: +1 (269) 329-7200
Fax: +1 (269) 329-7201
E-Mail: info-us@mann-hummel.com
Internet: www.mann-hummel.com/mhus

Mexico

MANN+HUMMEL MEXICO S.A. DE C.V.
Validad el Pueblito No. 104
Parque Industrial Queretaro
Santa Rosa Jauregui
Santiago de Queretaro, Queretaro, C.P. 76220
Tel.: +52 442 103 1100
Fax: +52 442 103 1103
E-Mail: infomx@mann-hummel.com
Internet: www.mann-hummel.com/mhmx

ASIA / AUSTRALIA

Australia

MANN+HUMMEL AUSTRALIA (PTY) LTD.
15/10 Chilvers Road
Thornleigh, NSW 2120
Tel.: +61 2 9484 4300
Fax: +61 2 9484 4175
E-Mail: info@mann-hummel.com.au
Internet: www.mann-hummel.com

India

MANN+HUMMEL
FILTER TECHNOLOGY (S.E.A.) PTE LTD.
India Representative Office
#346, 1st Floor, 3rd Cross
8th 'A' Main, 4th Block
Koramangala
560034 Bangalore
Tel.: +91 80 5121 7111
Fax: +91 80 2553 8584
E-Mail: ajith.nair@mann-hummel.com
Internet: www.mann-hummel.com.sg

Japan

MANN+HUMMEL WAKO CO. LTD.
Shin Yokohama Daiichi Bldg 2F
2-14-27, Shin Yokohama
Kohoku-ku, Yokohama-shi Kanagawa-ken 222-0033
Tel.: +81 (45) 470-4611
Fax: +81 (45) 470-0812
E-Mail: info@mann-hummel-wako.com
Internet: www.mann-hummel.com

SOUTH AMERICA

Argentina

MANN+HUMMEL Argentina S.A.
Sdor. Francisco Quindimil 4425/95
B1822APC Valentín Alsina
Buenos Aires
Tel.: +54 11 4208 1200
Fax: +54 11 4228 6691
E-Mail: info@mann-hummel.com.ar
Internet: www.mann-hummel.com/mhar

Brazil

MANN+HUMMEL Brasil Ltda.
Caixa Postal 210
Alameda Filtros Mann 555
CEP 13330-970 Indaiatuba-SP
Tel.: +55 19 3894 94 00
Fax: +55 19 3894 51 31
E-Mail: marketec@mann-hummel.com.br
Internet: www.mann-hummel.com.br

China

MANN+HUMMEL FILTER TRADING
(SHANGHAI) CO.,LTD.
Huadu Mansion, Floor 24/A-F,
No. 838, Zhangyang Road, Pudong
Shanghai 200122
Tel.: +86 21 58 20 1086
Fax: +86 21 58 20 6015
E-Mail: infomhcn@mann-hummel.com
Internet: www.mann-hummel.com

Singapore

MANN+HUMMEL FILTER TECHNOLOGY
(S.E.A.) PTE LTD.
3 Toh Tuck Link
#03-01/02/03 German Districentre
596228 Singapore
Tel.: +65 6586 8181
Fax: +65 6586 8180
E-Mail: mhsg@mann-hummel.com.sg
Internet: www.mann-hummel.com.sg

Conversion factors

Temperature	$^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$ $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$
Flow rate	$1 \text{ l/min} = 0.0353 \text{ cfm}$ $1 \text{ m}^3/\text{min} = 35.3140 \text{ cfm}$ $1 \text{ m}^3/\text{h} = 0.5886 \text{ cfm}$ $1 \text{ UK gallon/min} = 0.1605 \text{ cfm}$
Length	$1 \text{ m} = 1000 \text{ mm} = 39.38 \text{ inch} = 3.281 \text{ ft.}$ $1 \text{ inch} = 25.4 \text{ mm} = 0.0254 \text{ m} = 0.08333 \text{ ft.}$ $1 \text{ ft.} = 304.8 \text{ mm} = 0.3048 \text{ m} = 12 \text{ inch}$
Volumes	$1 \text{ m}^3 = 1000 \text{ litres} = 35.31 \text{ ft.}^3 = 61020 \text{ inch}^3$ $1 \text{ ft.}^3 = 28.32 \text{ litres} = 0.02832 \text{ m}^3 = 1728 \text{ inch}^3$ $1 \text{ l} = 0.2642 \text{ US gallons} = 0.2201 \text{ UK gallons}$ $1 \text{ US gallon} = 3.785 \text{ litres} = 231 \text{ inch}^3$ $1 \text{ UK gallon} = 4.544 \text{ litres} = 277 \text{ inch}^3$
Weight	$1 \text{ kg} = 2.205 \text{ lb} = 35.27 \text{ Oz}$ $1 \text{ lb} = 0.4536 \text{ kg} = 16 \text{ Oz}$ $1 \text{ Oz} = 0.02835 \text{ kg} = 0.0625 \text{ lb}$
Pressure	$1 \text{ bar} = 100 \text{ KPa} = 14.5 \text{ psi} = 401.5 \text{ IN. H}_2\text{O}$ $10 \text{ mbar} = 1 \text{ KPa} = 0.145 \text{ psi} = 4.015 \text{ IN. H}_2\text{O}$ $10 \text{ psi} = 68.95 \text{ KPa} = 0.6895 \text{ bar} = 27.68 \text{ IN. H}_2\text{O}$ $1 \text{ IN. H}_2\text{O} = 0.2491 \text{ KPa} = 2.491 \text{ mbar} = 0.03613 \text{ psi}$

Configuration of adsorption filters

MANN+HUMMEL GMBH
Business Unit Industrial Filters
Brunckstr. 15, 67346 Speyer, Germany

Fax to: +49 (62 32) 53-81 50

☐ Please indicate your application for the adsorption filter:

- Application (e.g. clean room technology, kitchen air, etc.): _____
- Harmful gases or odours requiring filtration: _____
- Type of air: ☐ Incoming air ☐ Circulating air ☐ Outgoing air
- Air volume in m³/h: _____
- Concentration of harmful gases in (e.g. µg/m³, ppm, ppb): _____
- Maximum installation size for the filter (length / width / height): _____
- Is a frame required: ☐ Yes ☐ No

If yes, what sort of frame (e.g. compact filter cell, metal frame)?

- Permissible pressure drop (Pa): _____
- Required separation performance in %: _____
- Required service life in operational hours: _____
- Environmental conditions:
Temperature in °C: _____
Air humidity in %: _____ Air pressure in bar: _____
- Other requirements: _____

Company _____

Name _____

Dept. _____

Street _____

Post code/City _____

Country _____

Tel. _____

Fax _____

E-Mail _____



MANN+HUMMEL Industrial Filters

The MANN+HUMMEL Group is an international company with its headquarters in Ludwigsburg, Germany. The group employs approx. 9100 people worldwide at more than 40 locations.

The company develops, produces and sells technically complex components for the

automotive industry and many other fields. A key area is high quality filtration products for vehicles, engines and industrial applications. The OEM business with global market leaders and producers of vehicles, machines and installations defines the quality and performance of the group. Filters for the

international aftermarket are sold under numerous international brands as well as under the MANN-FILTER brand.

The Industrial Filters Business Unit with its headquarters in Speyer, Germany is specialised in meeting the requirements of off-highway vehicle

and - engine applications, compressed air and vacuum technology, mechanical engineering and plant construction. For these and other industrial fields MANN+HUMMEL Industrial Filters offers high performance products for the filtration and separation of air, gases and liquids.



MANN+HUMMEL GMBH, Business Unit Industrial Filters
 67346 Speyer, Germany, Telephone +49 (62 32) 53-80, Fax +49 (62 32) 53-88 99
 E-Mail: if.info@mann-hummel.com, Internet: www.mann-hummel.com