

**60** YEAR ANNIVERSARY  
**FILTERFANS**

Thermal Management For Electrical Enclosures

—  
Trust in the Original.  
Since 1958.

SHARING  
COMPETENCE 

**Pfannenberg**   
ELECTRO-TECHNOLOGY FOR INDUSTRY

## Content

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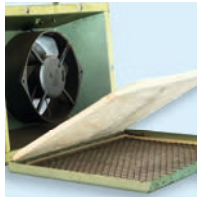
# Pfannenberg Filterfans® - The trusted name for forced convective cooling.

Invented in Germany in 1958 by Otto Pfannenberg. The Filterfan® revolutionized the world of industrial manufacturing. As a result of 60 year's experience and continuous development our Filterfan product continues to be the easiest to install and most efficient way to cool sensitive electronics using ambient air.

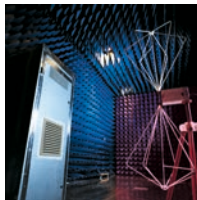




**Otto Pfannenber**  
The Inventor of  
Thermal Management  
for Electrical Enclosures.  
Page 4 – 5



**Product history**  
Generation 1 – 4.  
Page 6 – 7



**Product advantages**  
Patented Originality.  
Page 8 – 9



**Indoor Filterfans IP 54**  
Standard Excellence.  
Page 10 – 11



**Outdoor Filterfans IP 55**  
Designed for the  
Toughest Applications.  
Page 12 – 13



**EMC Filterfans**  
Protection from Electro-  
magnetic Interference.  
Page 14 – 15



**Top mounting Filterfans**  
Convection Perfection.  
Page 16 – 17



**Filter mats**  
Best Protection  
Against Contamination.  
Page 18 – 19



**Variants**  
Standard Versatility.  
Page 20 – 21



**Filterfan 4.0**  
Product Overview.  
Page 22 – 23

**Otto Pfannenberg**

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## The Inventor of Thermal Management for Electrical Enclosures.

At a time when Germany's production facilities were in full swing, Otto Pfannenberg's invention prevented industrial progress from overheating.



## Passionate for New Ideas.

The 1950s were a critical time period for industrial development in Germany. Creative and hard-working people laid the foundation for economic reconstruction. One of them: Otto Pfannenberg.

In 1958, four years after founding his own company, this Hamburg based electrical engineer achieved a revolutionary invention. The Filterfan® allowed a higher degree of safety in the management of modern manufacturing processes.

Otto Pfannenberg's main focus was the development and assembly of electrical enclosures, which became more and more widespread throughout production facilities. He regularly encountered the problem of overheating components in control cabinets.

With the development of the first Filterfan®, he presented a ground-breaking solution to counter these heat related issues and the rest is history. Our company's success begins here.

From generation to generation, our world-class engineers have been working on the continuous

technological development of Pfannenberg Filterfan® products. Numerous improvements are continuously made including several breakthroughs, so valuable that they required international patents. All in all our Filterfans 4.0™ contain 11 field-proven patented features.

It is an honour for me to celebrate the 60th anniversary of our Filterfans®, together with our partners and everyone who has been involved throughout the years.

It is safe to say, that Pfannenberg's Filterfans® set a high benchmark in today's industrial market; resulting in a market position that we want to retain in the future - with the passion that has driven Otto Pfannenberg: the passion for new ideas.

Andreas Pfannenberg, CEO

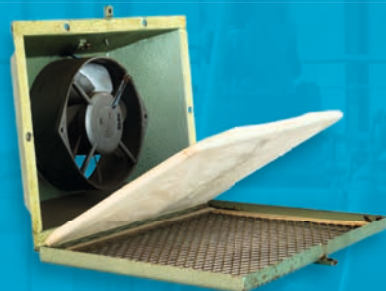


Pfannenberg International Sales Meeting  
Hamburg, 23. April 2018



1958.

The 1st generation Pfannenberg Filterfan® combines robustness with effectiveness. Built in a metal housing, they were either mounted on the roof or on the side of the control cabinet. A filter cloth prevented dust particles from reaching the inside of the enclosure with the airflow.



1982.

The 2nd generation Pfannenberg Filterfan® was made of a self-extinguishing plastic. Further innovations: Installation and maintenance became significantly easier with this model. The hole pattern allowed quick visual detection of a clogged filter mat while special air inlets prevented excessive dust build-up.



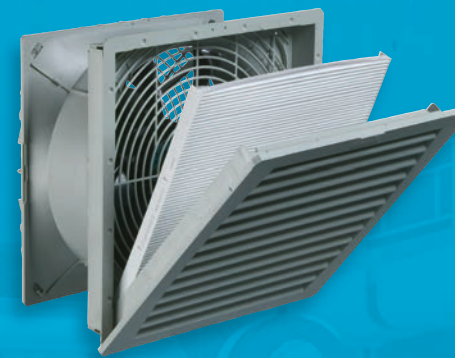


1990.



The 3rd generation Pfannenberger Filterfan® saw another improvement in performance and efficiency. This was a precursor to today's fin design. For the first time, a patented folding mechanism allowed for the replacement of two different sized filter mats, in just a matter of seconds.

Now.



The 4th Generation Pfannenberger Filterfan® our Filterfan 4.0™, sets a new standard in Filterfan® design. Installs faster with our new 4-corner fastening system, produces maximum airflow with optimized fins and rotor blades and achieves a 300% longer service life with our fluted filter mat.



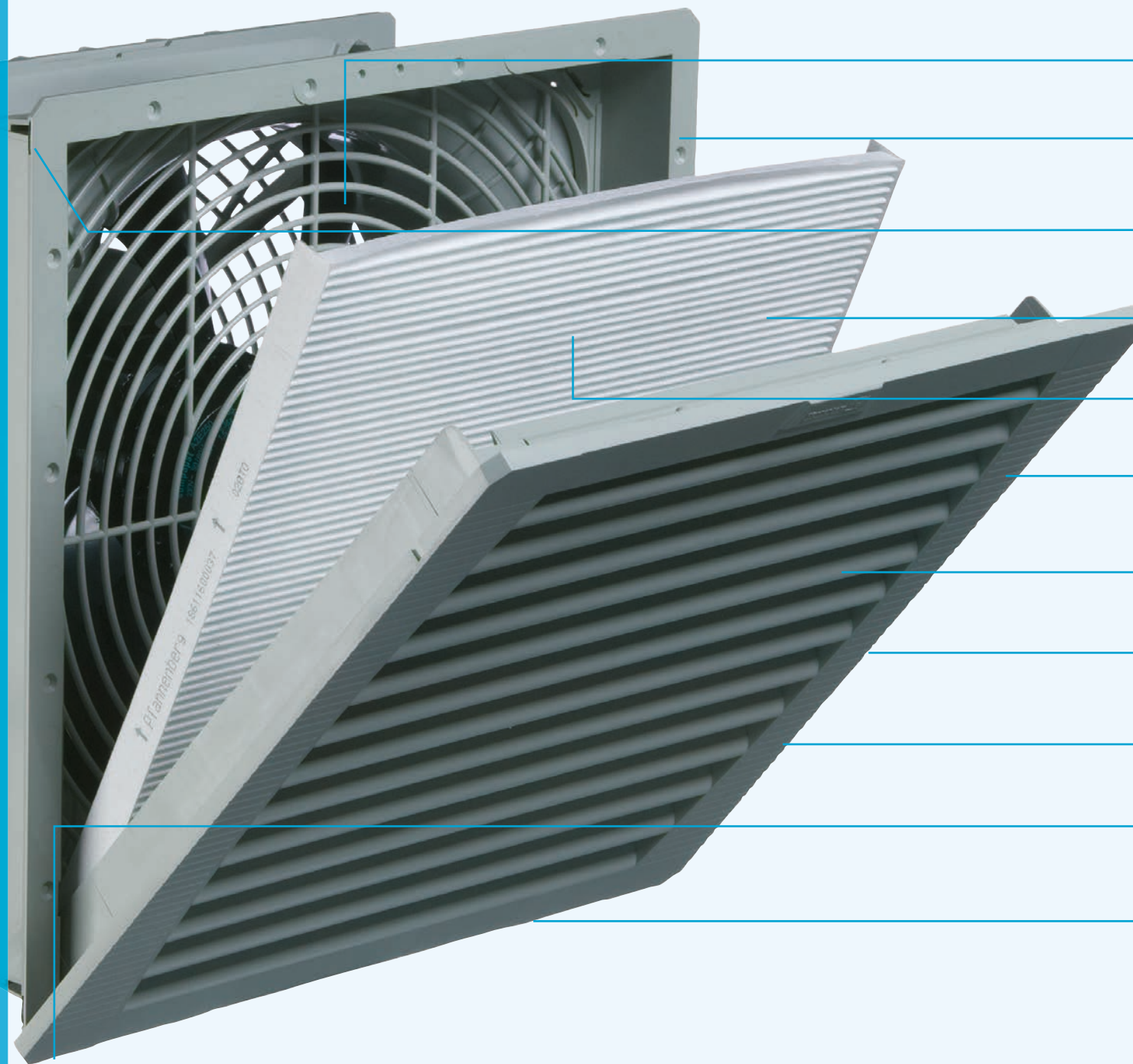
## Product advantages

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### Patented Originality.

Pfannenberg Filterfans 4.0™ are the result of 60 year's experience and continuous development. No fewer than 11 patented features ensure our leading position in the market. As part of the Pfannenberg eCOOL product line, our Filterfans® meet the increased demands of the industry in several areas:

- Energy efficiency.
- Environment friendliness.
- Service friendliness.





#### Reduced Energy Consumption

More air, less power consumption.

#### IP 54 Protection

Closed frame prevents un-filtered air from penetrating.

#### Patented 4 corner fastening system

For tool-less installation within seconds.

#### Unrivalled air flow even at IP 55

Via patented fluted filter mat.

Service time is up to 300% longer via patented fluted filter mat. This saves time and money.

#### Neutral design without colour irritations

Perfect harmony of colours with modern machines and equipment.

#### Airflow optimized fins and rotor blades

guarantee maximal airflow with minimal energy consumption.

#### Efficiency

Filterfans 4.0™ can be equipped with an optional thermostat – only when cooling is actually necessary.

#### Easy integration in existing applications

since most of the housing cut-out comply with the Pfannenberg standard.

#### Easy and fast maintenance

The click mechanism of the cover enables a filter mat replacement in seconds.

#### Filterfans 4.0™ comply with national and international standards

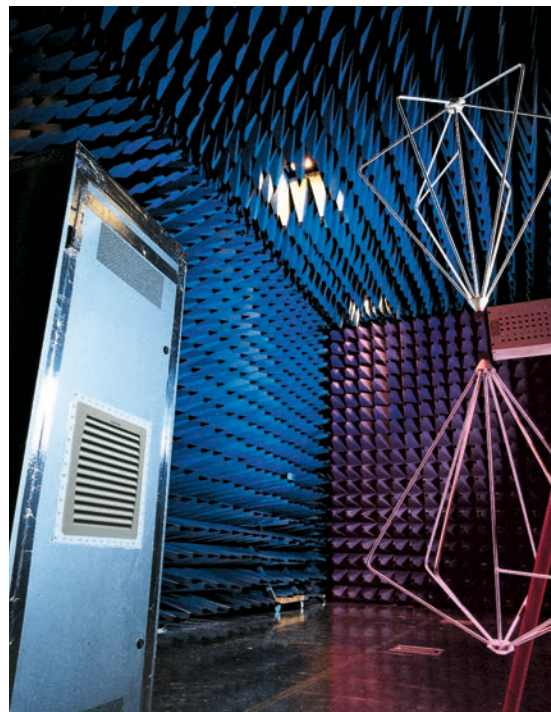
e.g. TÜV, NEMA, cURus, EAC, CSA, CE



## Designed to Deliver Maximum Airflow Using Minimal Energy.

When developing the Pfannenberg Filterfans 4.0™, our engineers worked to make sure that minimal energy was used to produce maximum airflow. For this purpose we carried out extensive studies to measure and optimize the air flow characteristics of the rotor blades and fins in the housing covers. After more than 1000 tests in our own climate chambers, the design was

ready for market launch. In addition to maximum airflow with minimal energy usage, further improvements were achieved. The fins in the front cover have been specially designed to pre-filter the air, reducing the amount of dust particles and water droplets that can reach the filter mat. Lastly the design aesthetic was considered to allow the Filterfans® to integrate professionally into the design of each application.



## Superior Protection Against Electromagnetic Radiation.

In most cases, industrial control cabinets are made of sheet steel. As a result of this choice of material, the cabinet provides very good protection against electromagnetic radiation. This protection is compromised by the plastic Filterfan® and cut-outs in the cabinet, allowing for electromagnetic waves to enter and escape in both directions through the opening. EMC Filterfans® close this “hole” safely and effectively. The EMC variants of Pfannenberg Filterfans 4.0™ have a safe contact surface, without a beryllium-copper-seal. The contact is made simply via the edge of the Filterfan or exhaust

filter cut-out. This eliminates the need to scrape off the the coating or adhere a similar aid such as copper tape. Ultimately reducing the need to elaborately modify the cut-out so that good contact is made.

See pages 14 and 15 to learn more about our EMC Filterfans®

## Indoor IP 54 Filterfans®

# Standard Excellence.

When it comes to safe and cost-effective cooling of electrical enclosures with filtered ambient air, our Filterfans® are the best choice. Available in five different sizes to fit different airflow requirements. IP 54 Filterfans® are ideal for applications that can use the cooler outside ambient air to lower the cabinet to the required internal temperature.

- IP 54: High protection against dust and water droplets.
- Closed frame prevents unfiltered air from entering.
- All variants, accessories and order details on p. 22.





## Indoor IP 54 Filterfans®.

Airflow rate: 25 – 875 m<sup>3</sup>/h.



size



size



size



size



size



protection class



tool less filtermat  
changing



tool less mounting



black / RAL 9011



RAL 7035

## Optional: Thermostat and Hygrostat



Filterfans 4.0™ can be optionally equipped with Pfannenberg FLZ Series thermostats and hygrometers, allowing for operation only when cooling is actually necessary. This allows for additional energy savings, reduced maintenance and extended service life.



## Exhaust Filter.



size



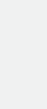
size



size



size



size



protection class



tool less filtermat  
changing



tool less mounting



black / RAL 9011



RAL 7035

## Indoor/Outdoor IP 55 Filterfans®

# Designed for the Toughest Applications.

Created for the most demanding indoor and outdoor applications; specifically wet, dusty and dirty environments. Thanks to innovative filter mat technology, Filterfans 4.0™ provide exceptionally reliable airflow performance with a high degree of IP 55 protection and extra-long service life.

- IP 55: high protection against dust and protection against water jets from any angle.
- Innovative filter mat: 300% Longer service life and outstanding airflow performance.
- Closed frame prevents unfiltered air from entering cabinet.
- UV protection thanks to special plastic
- All variants, accessories and order details on p. 22.





### Indoor/Outdoor IP 55 Filterfans®.

Airflow rate: 56 – 950 m³/h.



size



size



size



size



resistant



protection class



tool less filtermat  
changing



tool less mounting



RAL 7035



### Exhaust Filters.



size



size



size



size



resistant



protection class



tool less filtermat  
changing



tool less mounting



RAL 7035



### Rainhoods.



size



size



size



size



size



stainless steel  
NEMA 4X/4 and IP X6



RAL 7035  
NEMA 3R/4 and IP X6

### Optional: Thermostat and Hygrostat



Filterfans 4.0™ can be optionally equipped with Pfannenberg FLZ Series thermostats and hygrosats, allowing for operation only when cooling is actually necessary. This allows for additional energy savings, reduced maintenance and extended service life.

## EMC Filterfans®

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# Widest Range of Protection from Electro-magnetic Interference.

Pfannenbergs EMC Filterfans® provide the required shielding and damping necessary to protect equipment from electromagnetic interference when cooling with the outside ambient air. Our EMC Filterfans® and exhaust filters use environmentally friendly non-metalized, recyclable plastics.

- Damping at 30 MHz approx. 71 dB.
- Damping at 400 MHz approx. 57 dB.
- Safe contact surface without a beryllium-copper seal.
- IP 54: High protection against dust and water droplets.
- IP 55: high protection against dust and protection against water jets from any angle.
- All variants, accessories and order details on p. 22.





## EMC Filterfan.

Air flow rate: 19 – 950 m³/h.



size



size



size



size



size



protection class



protection class



tested



tool less filtermat  
changing



tool less mounting



resistant  
variant IP 55



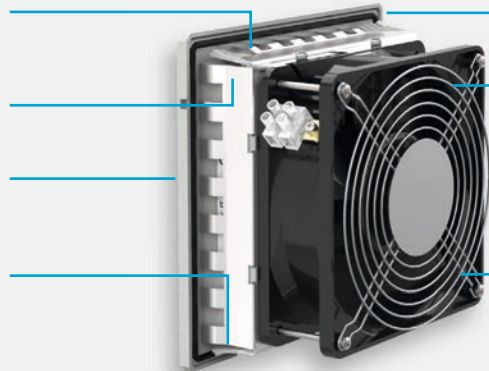
RAL 7035

**Safe and secure contact**  
with enclosure via contact springs.

**The patented 4-corner fastening system**  
allows for a tool-free installation in seconds.

**No scratching off of coating is necessary**  
Contact is made via the cut edge of the cut-out.

**Quick and easy maintenance thanks to innovative click mechanism**  
For a tool-free filter mat replacement in seconds.



**Metal shielding**  
for higher electromagnetic protection.

**Reduced energy consumption**  
More airflow, less power consumption.

**Up to 300% longer service life thanks to innovative fluted filter mat**  
For effective cost reduction.

**No elaborate reworking**  
of the cut-out.

## Optional: Thermostat and Hygrostat



Filterfans 4.0™ can be optionally equipped with Pfannenberg FLZ Series thermostats and hygrostats, allowing for operation only when cooling is actually necessary. This allows for additional energy savings, reduced maintenance and extended service life.



## Exhaust Filters.



size



size



size



size



size



protection class



protection class



tested



tool less filtermat  
changing



tool less mounting



resistant  
variant IP 55



RAL 7035

## Top Mount Filterfans®

# Convection Perfection.

Pfannenberg top-mount Filterfans® are moving the enclosure heat from the top of the enclosure, it is especially ideal for enclosures used in tight spaces. Using a combination of standard Filterfans® and exhaust filters at the bottom of the enclosure helps to compensate for static pressure loss. This configuration is perfect for optimal air flow and temperature distribution within the enclosure.

- IP 54: High protection against dust and water droplets.
- All variants, accessories and order details on p. 22.





## Top Mount Filterfans®.

Air flow rate: 310 – 1035 m³/h.



size



protection class



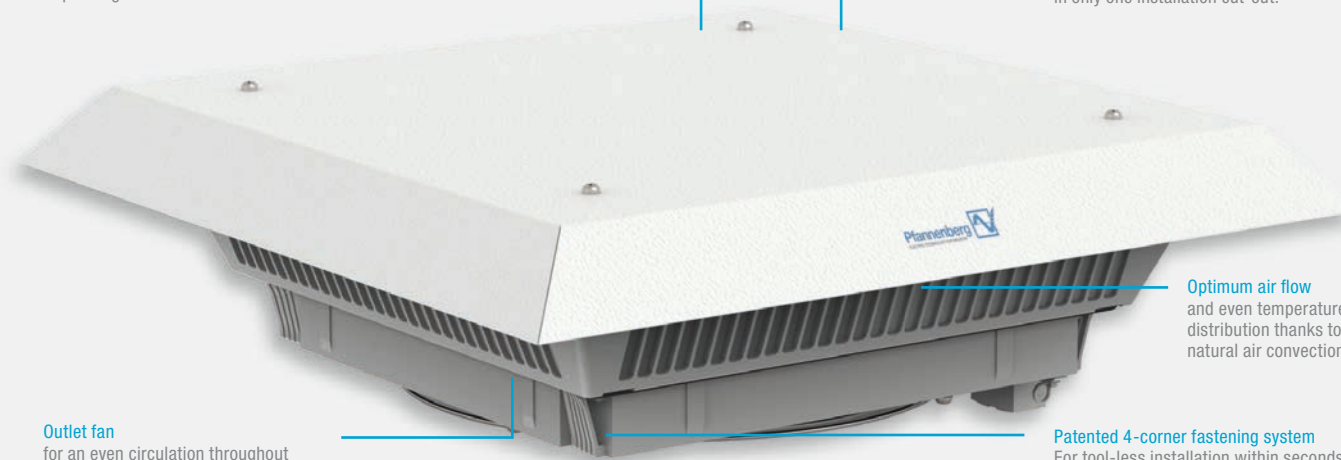
tool less mounting



RAL 7035

Operational with/without filter mats depending of ambient conditions.

3 performance classes in only one installation cut-out.



Optimum air flow and even temperature distribution thanks to natural air convection.

### Outlet fan

for an even circulation throughout the electrical enclosure.

Patented 4-corner fastening system For tool-less installation within seconds.

## Optional: Thermostat and Hygrostat



Filterfans 4.0™ can be optionally equipped with Pfannenberg FLZ Series thermostats and hygrostats, allowing for operation only when cooling is actually necessary. This allows for additional energy savings, reduced maintenance and extended service life.

## Exhaust Filter.



size



protection class



tool less mounting



RAL 7035



## Filter Mats

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# Best Protection Against Contamination.

Dust, lint, wood chips or moisture in the atmosphere are undesirable by-products of many production processes. To protect electrical components and switchgear from harmful particulate, Pfannenberg offers different types of filter mats giving you the best possible protection.

- Highest filter classification G4: filtration of particles smaller than 10  $\mu\text{m}$ .
- IP 54: High protection against dust and water droplets.
- IP 55: high protection against dust and protection against water jets from any angle.





### Pfannenberg Synthetic Fibre Filtermat

Pfannenberg G4 synthetic fibre filter mats have the highest filter class according to DIN EN 779 and are the perfect filter medium for the majority of applications. They guarantee reliable air filtration of various types of dust with high air flow rates. This ensures filtration of more than 90% of all particles larger than 10 µm, effectively protecting the inside of the control cabinet against contamination.

Suitable for:



### Pfannenberg Fluted Filtermat

Pfannenberg G4 fluted filter mats meet the highest standards of efficiency and economy. Our innovative folded structure provides a larger filter surface, which allows higher airflow rates and increased resistance to moisture and water jets. Compared to standard synthetic fibre filter mats, they allow up to a 300% longer service life, saving time and money on maintenance.

Suitable for:



## The Best Protection: Pfannenberg Filters.

Sensitive electronics deserve the best protection against harmful particulate. The quality of a filter is defined by how many particles of a certain size can pass through the filter medium. This is known as filter class. The highest achievable

filter class by coarse dust filters is G4. G4 means that a filter prevents more than 90% of all particles smaller than 10 µm from passing through. At Pfannenberg, G4 is standard for all our filter mats, synthetic fibre and fluted versions.

FILTER MEDIA	STANDARD FLEECE FILTER	PFANNENBERG SYNTHETIC FIBRE FILTERS	PFANNENBERG FLUTED FILTERS
	G3	G4	G4
Filtration Efficiency	80 - 90 %	> 90 %	> 90 %
Sand	•	•	•
Dust	•	•	•
Wood chips	•	•	•
Paint fumes		•	•
Air conditioning		•	•
Cement particles			•
Longer service life (up to 300%)			•
Protection against water jets			•

## Additional Options

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### Standard Versatility.

For enclosures with very limited space inside, our Slim Line Filterfans® offer the perfect solution. Another option is colour, in addition to our grey RAL 7035 we also have black RAL 9011 Filterfans® and exhaust filters. We can even match a customer's colour specification to complement their machine design.

- Slim Line Filterfan IP 55: powerful, compact design, high protection against dust and against water jets from any angle.
- RAL 9011 Indoor Filterfan IP 54: High protection against dust and water droplets.
- All variants, accessories and order details on p. 22.



## IP 55 Slim Line Filterfans®.

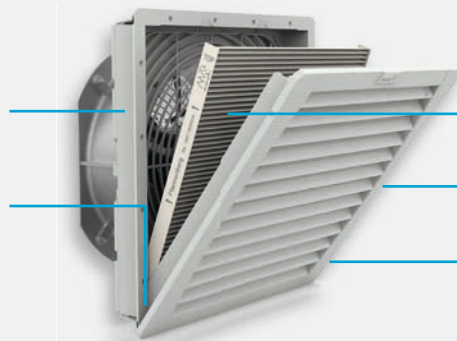
Airflow rate: 500 – 725 m³/h.

### IP 55 hose-proof

Increased protection for humid environment.

### Quick and easy maintenance

Tool-free filter mat replacement in seconds with our innovative click mechanism.



High performance with 300% longer service life  
Innovative fluted structure of the filter mat.

Low installation depth  
No collision with built-in components.

UV resistant  
For outdoor and indoor applications.

## Optional: Thermostat and Hygrostat



Filterfans 4.0™ can be optionally equipped with Pfannenberg FLZ Series thermostats and hygrostats, allowing for operation only when cooling is actually necessary. This allows for additional energy savings, reduced maintenance and extended service life.

## Filterfans® in RAL 9011.

Airflow rate: 25 – 875 m³/h.



## Exhaust Filters in RAL 9011.



FILTERFANS	AIRFLOW RATE	PROTECTION RATING	DIMENSIONS	COLOR	RATED VOLTAGE	ARTICLE NUMBER	APPROVALS			
	m <sup>3</sup> /h	IP 54	(Cut-out mm x mm)	RAL 7035	230 V		cULus	EAC	CSA	CE
PF 11.000	19	•	92 x 92	•	•	11611101055	•	•	•	•
PF 22.000	60	•	125 x 125	•	•	11622101055	•	•	•	•
PF 32.000	98	•	177 x 177	•	•	11632101055	•	•	•	•
PF 42.500	125	•	223 x 223	•	•	11642101055	•	•	•	•
PF 43.000	223	•	223 x 223	•	•	11643101055	•	•	•	•
PF 65.000	480	•	291 x 291	•	•	11665102055	•	•	•	•
PF 65.000 SL	500	•	291 x 291	•	•	11675102055	•	•	•	•
PF 66.000	640	•	291 x 291	•	•	11666102055	•	•	•	•
PF 67.000	845	•	291 x 291	•	•	11667102055	•	•	•	•
PF 67.000 SL	705	•	291 x 291	•	•	11677102055	•	•	•	•
PTF 60.500	310	•	291 x 291	•	•	11685101055	•	•	•	•
PTF 60.700	646	•	291 x 291	•	•	11687102055	•	•	•	•
PTF 61.000	1035	•	291 x 291	•	•	11681102055	•	•	•	•
Exhaust filters										
PFA 10.000		•	92 x 92	•		11710001055	•	•	•	•
PFA 20.000		•	125 x 125	•		11720001055	•	•	•	•
PFA 30.000		•	177 x 177	•		11730001055	•	•	•	•
PFA 40.000		•	223 x 223	•		11740001055	•	•	•	•
PFA 60.000		•	291 x 291	•		11760002055	•	•	•	•
PTFA 60.000		•	291 x 291	•		11786001055	•	•	•	•
Filter mats (packaging unit 5 pieces / PTF, PTFA 20 pieces)										
Size 1		•	87 x 87			18611600029				
Size 2		•	119 x 119			18611600030				
Size 3		•	170 x 170			18611600031				
Size 4		•	216 x 216			18611600032				
Size 6		•	284 x 284			18611600033				
Size 6 (PTF 60.500, PTFA 60.000)		•	290 x 70			18611600124				
Size 6 (PTF 60.700, PTF 61.000)		•	390 x 100			18611600143				

FILTERFANS	ADDITIONAL AVAILABLE VARIANTS*							
	IP 55	RAL 9011	EMC	12 V	24 V	48 V	115 V	400/460 V
PF 11.000		•	•	•	•	•	•	
PF 22.000	•	•	•	•	•	•	•	
PF 32.000	•	•	•	•	•	•	•	
PF 42.500	•	•	•	•	•	•	•	
PF 43.000	•	•	•	•	•	•	•	•
PF 65.000	•	•	•				•	
PF 65.000 SL	•	•					•	
PF 66.000	•	•	•				•	•
PF 67.000	•	•	•				•	•
PF 67.000 SL	•	•					•	•
PTF 60.500							•	
PTF 60.700							•	
PTF 61.000							•	

Exhaust filters								
PFA 10.000	•	•	•					
PFA 20.000	•	•	•					
PFA 30.000	•	•	•					
PFA 40.000	•	•	•					
PFA 60.000	•	•	•					
PTFA 60.000								

\*For further details and article numbers please visit [www.pfannenberg.com](http://www.pfannenberg.com)



CUT-OUT SIZES (MM)					
	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 6
	92 X 92	125 X 125	177 X 177	223 X 223	291 X 291

Filterfans					
PF 11.000	•				
PF 22.000		•			
PF 32.000			•		
PF 42.500				•	
PF 43.000				•	
PF 65.000					•
PF 66.000					•
PF 67.000					•
PF 65.000 SL					•
PF 67.000 SL					•
PTF 60.500					•
PTF 60.700					•
PTF 61.000					•

Exhaust filters					
PFA 10.000	•				
PFA 20.000		•			
PFA 30.000			•		
PFA 40.000				•	
PFA 60.000					•
PTFA 60.000					•

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