



Spigot with fixed baffle plate



Spigot with adjustable baffle plate



Spigot with damper blade

# Mini Pleat filters

## FHD



### For the most critical requirements in clean room areas

Final filters for the separation of suspended particles, suitable for industrial, research, medical, and pharmaceutical applications

- Filter classes E11, H13, H14, U15
- Performance factory tested to EN 1822-1 and ISO 29463-2 to ISO 29463-5
- Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
- Low initial differential pressure due to ideal pleat position and largest possible filter area
- Perfect adjustment to individual requirements due to different constructions
- Filter hood available in various sizes and the usual grid sizes
- Automatic filter scan test for all filters from filter class H14
- Meets the hygiene requirements of VDI 6022

Optional equipment and accessories

- Mechanism for volume flow rate setting



Tested to VDI 6022

General information	2	Order code	5
Technical data	3	Variants	6
Specification text	4	Dimensions	7

## General information

### Application

- Mini Pleat filter panels with hood, type FHD, for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in clean room systems with controlled air cleanliness and airflow.
- Particulate filters: Final filters for the most critical requirements of air cleanliness and sterility in areas such as production, research, medicine, pharmaceuticals industry, and nuclear engineering

### Special characteristics

- Ideal pleat geometry of the filter medium
- Low-turbulence airflow on the downstream side
- Leakage test, standard for all particulate filters of classes H13, H14, U15

### Nominal sizes

- B × H × D [mm]

### Filter classes

#### Filter groups

- EPA according to EN 1822 - ISO 29463
- HEPA according to EN 1822 - ISO 29463
- ULPA according to EN 1822 - ISO 29463

#### Filter classes

- E11
- H13
- H14
- U15

### Options

- Spigot diameter
- PD: Protection grid on the downstream side
- SD: Stainless steel protection grid on the downstream side
- SPD: Perforated stainless steel face plate on the downstream side
- APD: Perforated aluminium face plate on the downstream side
- WS: Without seal
- FND: Flat seal on the downstream side
- OT: Oil mist test (only for filter classes H13, H14)
- OTC: Oil mist test with certificate (only for filter classes H13, H14)
- ST: Scan test (only for filter classes H13, H14, U15)

### Construction

- Without centre mullion, spigot with fixed baffle plate
- D: Centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R: Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V: Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

### Construction features

- Hood with top entry circular spigot
- Spigot diameter available in commercial sizes
- Some constructions are fitted with an optional flat seal on the downstream side
- Protection grid on downstream side: expanded metal grid or stainless steel
- Perforated stainless steel or aluminium face plate on the downstream side

### Materials and surfaces

- Filter media made of high-quality, moisture-resistant glass fibre papers, pleated
- Spacers provide a uniform spacing of the pleats
- Joint sealing compound made of permanently elastic two-component polyurethane adhesive
- Frame made from extruded aluminium sections
- Hood with spigot made of galvanised sheet steel

### Standards and guidelines

- Testing of particulate filters to EN 1822-1 and ISO 29463-2 to ISO 29463-5 (EPA, HEPA and ULPA filters): standards for the testing of filtration performance in the factory, particle counting method using a liquid test aerosol
- Uniform classification of particulate filters according to efficiency, using a test aerosol whose average particle size lies within the minimum efficiency (MPPS)
- Particulate filters are classified according to the values determined for the local filtration efficiency and the overall filtration efficiency as EPA (filter classes E10, E11, E12), HEPA (filter classes H13, H14) or ULPA (filter classes U15, U16, U17)
- Hygiene conformity: VDI 6022, VDI 3803, DIN 1946 Part 4, ÖNORM H 6020, SWKI VA 104-01 and SWKI 99-3 and EN 16798

## Technical Data

### Metric Units

Filter class according to EN 1822	E11	H13	H14	U15
Efficiency [%] according to EN 1822	> 95	> 99.95	> 99.995	> 99.9995
Nominal face velocity [m/s]	0.82	0.82	0.45	0.45
Initial differential pressure [Pa] at nominal face velocity	125	250	125	145
Recommended final differential pressure [Pa]	300	600	600	300
Max. operating temperature [°C]	80	80	80	80
Maximum relative humidity [%]	100	100	100	100

### Imperial Units

Filter class according to EN 1822	E11	H13	H14	U15
Efficiency [%] according to EN 1822	> 95	> 99.95	> 99.995	> 99.9995
Nominal face velocity fpm	161	163	89	89
Initial differential pressure [inWg] at nominal face velocity	0,50	1,00	0,50	0,58
Recommended final differential pressure [inWg]	1,21	2,41	2,41	1,21
Max. operating temperature [°F]	176	176	176	176
Maximum relative humidity [%]	100	100	100	100

## Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy

Product Finder design programme.

### Specification text

Mini Pleat filter panels with hood, type FHD, for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in clean room systems with controlled air cleanliness and airflow. Use as particulate filters, i.e. main or final filters, for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering. Mini Pleat filter panels with hood, consisting of an extruded aluminium frame, filter medium, and a hood with top entry circular spigot; filter media made from high-quality, moisture-resistant glass fibre papers with spacers made of thermoplastic hot-melt adhesive. Low initial differential pressure due to ideal pleat position and largest possible filter area. Filter hood available in various sizes and the usual grid sizes, filter classes E11, H13, H14 and U15. Optional flat seal and protection grid on the downstream side. Choice of expanded metal, powder-coated (RAL 9010) protection grid, stainless steel protection grid, or perforated plate made of stainless steel or aluminium. Mini Pleat filter panels from filter class H14 are subjected to an automatic filter scan test. Mini Pleat filter panels with hood FHD hygienically conform to VDI 6022.

### Special characteristics

- Ideal pleat geometry of the filter medium
- Low-turbulence airflow on the downstream side

- Leakage test, standard for all particulate filters of classes H13, H14, U15

### Materials and surfaces

- Filter media made of high-quality, moisture-resistant glass fibre papers, pleated
- Spacers provide a uniform spacing of the pleats
- Joint sealing compound made of permanently elastic two-component polyurethane adhesive
- Frame made from extruded aluminium sections
- Hood with spigot made of galvanised sheet steel

### Construction

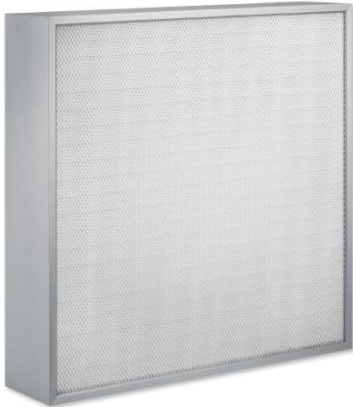
- Without centre mullion, spigot with fixed baffle plate
- D: Centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R: Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V: Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

### Sizing data

- Filter class [EN 1822]
- Volume flow rate [m<sup>3</sup>/h] - CFM
- Initial differential pressure [Pa] - InWg
- Nominal size [mm] - in

## Variants

FHD – Construction without centre mullion



FHD – Construction without centre mullion



FHD – Construction with centre mullion

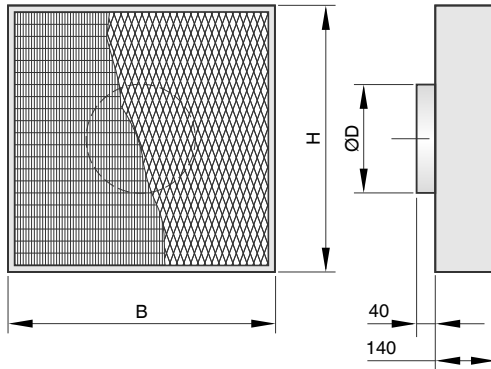
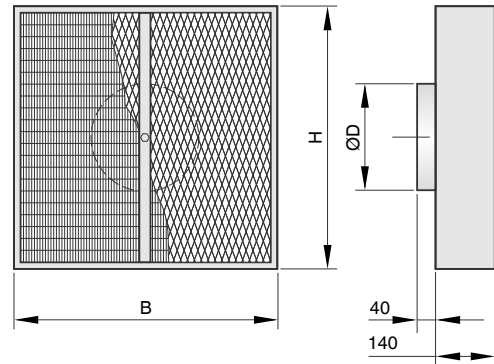


FHD – Construction with centre mullion



- Without centre mullion, spigot with fixed baffle plate
- D: Centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R: Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V: Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

## Dimensions - The Metric Market

**FHD – Construction without centre mullion**

**FHD – Construction with centre mullion**

**Product specific data**

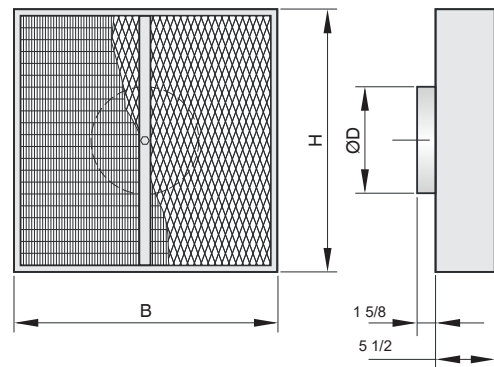
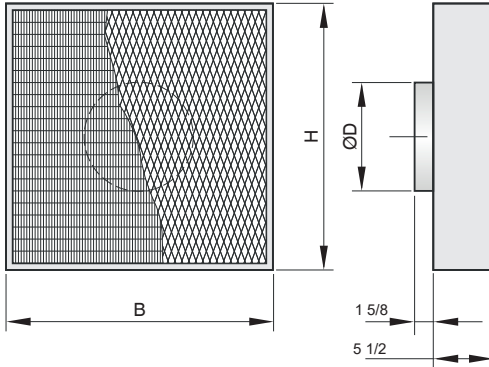
①			Filter class	Spigot diameter	②		③	④	⑤
B [mm]	H [mm]	T [mm]			qv [l/s]	qv [m³/h]	ΔpA [Pa]	m²	kg
305	305	140	E11	148	76	275	125	2,8	4
457	457	140	E11	198	172	620	125	6,2	6
305	610	140	E11	198	153	550	125	5,7	5,5
610	610	140	E11	248	306	1100	125	11,1	8,1
915	610	140	E11	248	458	1650	125	16,6	11,1
1220	610	140	E11	313	611	2200	125	22,1	14
305	305	140	H13	148	76	275	250	2,8	4
457	457	140	H13	198	172	620	250	6,2	6
305	610	140	H13	198	153	550	250	5,7	5,5
610	610	140	H13	248	306	1100	250	11,1	8,1
915	610	140	H13	248	458	1650	250	16,6	11,1
1220	610	140	H13	313	611	2200	250	22,1	14
305	305	140	H14	148	42	150	125	2,8	4
457	457	140	H14	198	94	340	125	6,2	6
305	610	140	H14	198	83	300	125	5,7	5,5
610	610	140	H14	248	168	605	125	11,1	8,1
915	610	140	H14	248	250	900	125	16,6	11,1
1220	610	140	H14	313	333	1200	125	22,1	14
305	305	140	U15	148	42	150	145	2,8	4
457	457	140	U15	198	94	340	145	6,2	6
305	610	140	U15	198	83	300	145	5,7	5,5
610	610	140	U15	248	168	605	145	11,1	8,1
915	610	140	U15	248	250	900	145	16,6	11,1
1220	610	140	U15	313	333	1200	145	22,1	14

① Nominal size ② Nominal volume flow rate ③ Initial differential pressure ④ Filter area ⑤ Weight

## Dimensions - The American Market

**FHD – Construction without centre mullion**

**FHD – Construction with centre mullion**



Standard dimensions for the American market - imperial units								
B in	H in	T in	Filter Class	Spigot diameter in	qv CFM	dpA[inWg]	ft <sup>2</sup>	lb
23 5/8	23 5/8	5 1/2	E11	9 6/8	626	0,5	115,2	17,3
47 5/8	23 5/8	5 1/2	E11	12 3/8	1262	0,5	231,4	30,0
23 5/8	23 5/8	5 1/2	H13	9 6/8	626	1,0	115,2	17,3
47 5/8	23 5/8	5 1/2	H13	12 3/8	1262	1,0	231,4	30,0
23 5/8	23 5/8	5 1/2	H14	9 6/8	344	0,5	115,2	17,3
47 5/8	23 5/8	5 1/2	H14	12 3/8	689	0,5	231,4	30,0
23 5/8	23 5/8	5 1/2	U15	9 6/8	344	0,6	115,2	17,3
47 5/8	23 5/8	5 1/2	U15	12 3/8	689	0,6	231,4	30,0

Standard dimensions for the American market - metric units								
B mm	H mm	T mm	Filter Class	Spigot diameter mm	qv m <sup>3</sup> /h	dpA[Pa]	m <sup>2</sup>	kg
600	600	140	E11	248	1.064	125	10,7	7,85
1210	600	140	E11	313	2.146	125	21,5	13,6
600	600	140	H13	248	1.064	250	10,7	7,85
1210	600	140	H13	313	2.146	250	21,5	13,6
600	600	140	H14	248	585	125	10,7	7,85
1210	600	140	H14	313	1.171	125	21,5	13,6
600	600	140	U15	248	585	145	10,7	7,85
1210	600	140	U15	313	1.171	145	21,5	13,6

**Order code - Metric units**

FHD – H13 – D / 1220 × 610 × 140 × 313 / PD / FND / ST  
 |        |        |        |        |        |        |        |  
 1        2        3                    4                    5        6        7        8

**1 Type**

**FHD** Mini Pleat filter panel with hood

B × H × T

**2 Filter class**

- E11** Particulate filter according to EN 1822
- H13** Particulate filter according to EN 1822
- H14** Particulate filter according to EN 1822
- U15** Particulate filter according to EN 1822

**5 Spigot diameter [mm]**  
D

**3 Construction**

- No entry: without centre mullion; spigot with fixed baffle plate
- D** centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R** Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V** Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

**6 Protection grid**

- PD** Protection grid on the downstream side
- SD** Stainless steel protection grid on the downstream side
- SPD** Perforated stainless steel face plate on the downstream side
- APD** Perforated aluminium face plate on the downstream side

**7 Seal**

- WS** without seal
- FND** Flat seal on the downstream side

**8 Testing**

- No entry: no leakage test
- OT** Oil mist test (only for filter classes H13, H14)
- OTC** Oil mist test with certificate (only for filter classes H13, H14)
- ST** Scan test (only for filter classes H13/H14/U15)

**4 Nominal size [mm]**

**FHD–H13–D/1220×610×140×313/PD/FND/ST**

<b>Filter class</b>	H13 Particulate filter according to EN 1822
<b>Construction</b>	centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
<b>Nominal size</b>	1220 × 610 × 140 mm
<b>Spigot diameter</b>	313 mm
<b>Protection grid</b>	downstream side
<b>Seal</b>	Flat seal on the downstream side
<b>Test</b>	scan test