Compressed Air Filtration

Replacement elements for filter housings of different manufacturers

FF N, MF N, SMF N

MAIN FEATURES & BENEFITS:

- Validated performance data acc. to ISO12500-1 and ISO12500-3.
- Use of innovative high performance filter media to achieve a high retention rate at low pressure losses (energy cost savings).
- 3 different filtration grades (fine-, micro- and sub-microfilter) enable flexible selection of filtration stages for different applications.
- Use of high quality materials, proven manufacturing technology and quality controls ensure high product quality.
- Strong focus on environment-friendlyness. Energy saving performance and main parts sourced and assembled in Germany ensure low CO_2 footprint.

INDUSTRIES:

- Chemical and pharmaceutical industry

- PCB assembly and CD manufacturing

- Surface finishing

- Machine building industry and plant engineering / construction

- Power plants

Donaldson Filtration Deutschland GmbH
Büssingstr. 1
D-42781 Haan
Tel.: +49 (0) 2129 569 0
Fax: +49 (0) 2129 569 100
E-Mail: CAP-de@donaldson.com
Web: www.donaldson.com

PRODUCT DESCRIPTION

The filter elements FF N, MF N, SMF N are designed for the purification of compressed air or gases in industrial range of use. The filter elements are available as replacement elements for filter housings of different manufacturers.

The used filter media ensure consistently high retention rates at low differential pressure.

The filter elements FF N, MF N and SMF N offer a three-dimensional micro fibre fleece made of coated borosilicate glass fibers, which repels oil and water efficiently.
By utilizing various filtration mechanisms like separation caused by impact, sieving and diffusion, liquids and solid state suspended particles up to 0.01 micron size will be retained in the filter.

The use of high quality materials (e.g. stainless steel liners) and the applied manufacturing technologies and quality controls ensure high product quality, “Made in Germany”.

Typical applications for the FF N, MF N, SMF N filter elements are:

- **Downstream filtration for control/ instrument and process air**
- **Prefiltration for the protection of adsorption dryers**
- **Partikel filtration downstream adsorption dryers**
- **Filtration upstream activated carbon filtration**

PRODUCT SPECIFICATIONS

Features:	Benefits:
Medium / Fluids	- Compressed air and other non-corrosive gases (no oxygen!) - Coalescence filter for removal of oil and water aerosoles - Particle filter
Range of use	Dependent of application and filter housings up to 400 bar
Temperature range	up to 80°C

Materials	
Filter media	Borosilicate glass fibre fleece
Coalescence sleeve	Polyurethane
Inner and outer liner	Stainless steel
End caps	Aluminium
O-rings	Perbunan
Potting compound	Polyurethane

PRODUCT SPECIFICATIONS

Table 1: Oil retention rate acc. to ISO 12500-1			
Element	**Oil retention rate acc. to ISO 12500-1**	**Residual oil content at inlet concentration**	
		10 mg/Nm³	**3 mg/Nm³**
FF N	98,7%	0,13 mg/Nm³	< 0,04 mg/Nm³
MF N	99,6%	0,04 mg/Nm³	< 0,02 mg/Nm³
SMF N	99,8%	0,02 mg/Nm³	< 0,01 mg/Nm³

Table 2: Particle retention rate acc. to ISO 12500-3									
Average particle size [µm]	**0,213**	**0,294**	**0,437**	**0,649**	**0,965**	**1,433**	**2,206**	**3,278**	**4,870**
FF N Average retention rate [%]	93,46	97,23	99,75	99,99	100	100	100	100	100
MF N Average retention rate [%]	99,27	99,83	100	100	100	100	100	100	100
SMF N Average retention rate [%]	99,97	100	100	100	100	100	100	100	100

Diagram 1: Differential pressure of the **filter elements** (without filter housing) in **dry** condition at 8 bar abs.

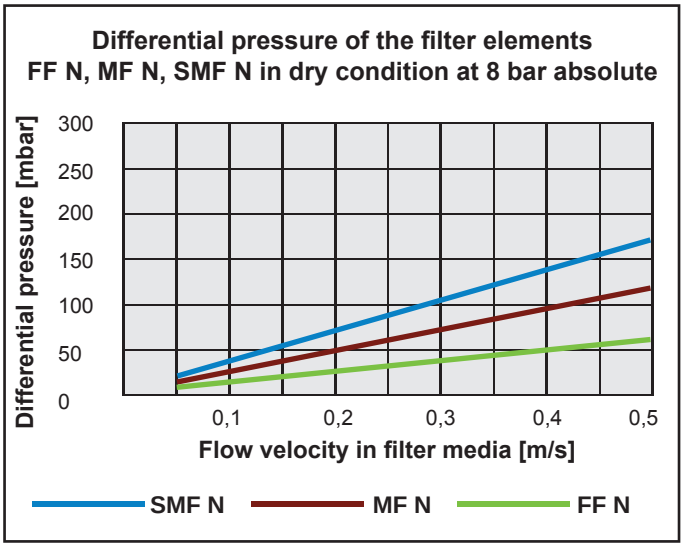
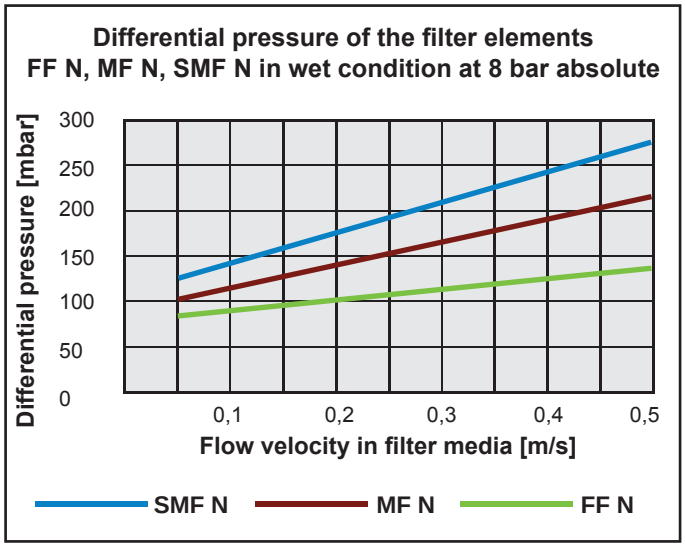


Diagram 2: Differential pressure of the **filter elements** (without filter housing) in **wet** condition at 8 bar abs (acc. to ISO 12500-1).

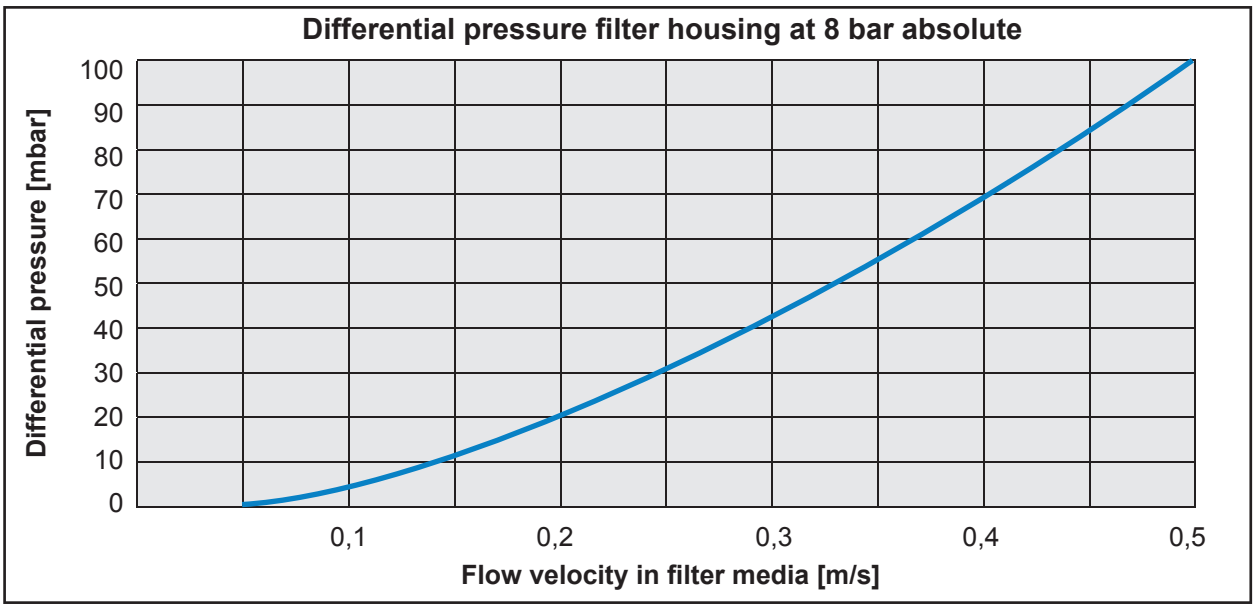


Overview of typical flow velocities of the filter elements for some alternative elements of different manufacturers.

Table 3: Flow velocity of filter elements		
Manufacturer	**Element series**	**Average flow velocity of reference element at nominal flow [m/s]**
Atlas Copco	PD/DD/DDP 9...7200	0,29
Zander	Z/ZP/Y/X/XP/XP4/ 1030...3075	0,30
Hankison	HF3/HF5/HF7HF9 12...80	0,32
Domnick Hunter	AO/AA/AX 0006...7800	0,34

PRODUCT SPECIFICATIONS

Diagram 3:
Differential pressure of **filter housings** without elements (guidelines) dependent of flow velocity in filter media, at 8 bar abs.



To understand the total filter pressure loss, the data for the reference element plus the data for the reference housing should be used.

Calculation example 1: Calculation of the total differential pressure for Zander alternative element, filtration grade MF N at **100%** of the nominal flow rate of the filter in **wet** condition.	**Calculation example 2:** Calculation of the total differential pressure for Domnick Hunter alternative element, filtration grade SMF N at **60%** of the nominal flow rate of the filter in **dry** condition.
Step 1: Determination of the flow velocity of reference element. The flow velocity of the Zander reference element at 100% nominal flow rate according to table 3 amounts to 0,30 m/s.	**Step 1:** Determination of the flow velocity of reference element. The flow velocity of the Domnick Hunter reference element at 100% nominal flow rate according to table 3 amounts to 0,34 m/s. At 60% of nominal flow rate the flow velocity amounts to 0,34 m/s x 0,6 = 0,20 m/s.
Step 2: Determination of the differential pressure of the filter element. In diagram 2 for the curve MF N at 0,30 m/s, a differential pressure of the filter element of approximately 160 mbar is indicated.	**Step 2:** Determination of the differential pressure of the filter element. In diagram 1 for the curve SMF N at 0,20 m/s a differential pressure of the filter element of approximately 70 mbar is indicated.
Step 3: Determination of the total differential pressure. The total pressure difference results from the differential pressure of the filter element plus the differential pressure of the filter housing. According to diagram 3, the differential pressure of the filter housing at flow velocity of 0,30 m/s in filter media amounts to approximately 40 mbar. The total differential pressure amounts to 160 mbar + 40 mbar = 200 mbar.	**Step 3:** Determination of the total differential pressure. The total pressure difference results from the differential pressure of the filter element plus the differential pressure of the filter housing. According to diagram 3, the differential pressure of the filter housing at flow velocity of 0,20 m/s in filter media amounts to approximately 20 mbar. The total differential pressure amounts to 70 mbar + 20 mbar = 90 mbar.