Energy Saving Compressed Air Filters

NGF SERIES 20 to 1500 scfm (34 to 2459 nm³/h)

Hankison®

Engineering Excellence

SPX is a place where innovation is valued, and the real needs of business are understood. We transform ideas into powerful solutions to help our customers meet their goals, overcome business challenges and thrive in a complex, always-changing marketplace.

Utilizing the latest technological advancements, NGF Series Compressed Air Filters offer a new way of thinking and innovative approach to efficiently clean compressed air.

Saving Energy Is A Global Priority

Energy costs continue to escalate globally, having a negative impact on plant profitability and production costs. Sustainability initiatives in plant operations must be implemented to maintain a competitive advantage.

Air treatment manufacturers are challenged to design equipment that is cost effective, delivers optimum performance and consumes less energy. The Hankison Next Generation Filter Series is the ideal solution to remove contamination from compressed air systems and save energy.

The Next Generation of Compressed Air Filtration

The NGF Series employs technological advancements in filtration materials and design to ensure premium compressed air quality and low operational costs.

Filters are tested and rated delivering certifiable performance according to ISO 8573-1: 2010 air quality standards.

Sustainable Energy Saving Solutions

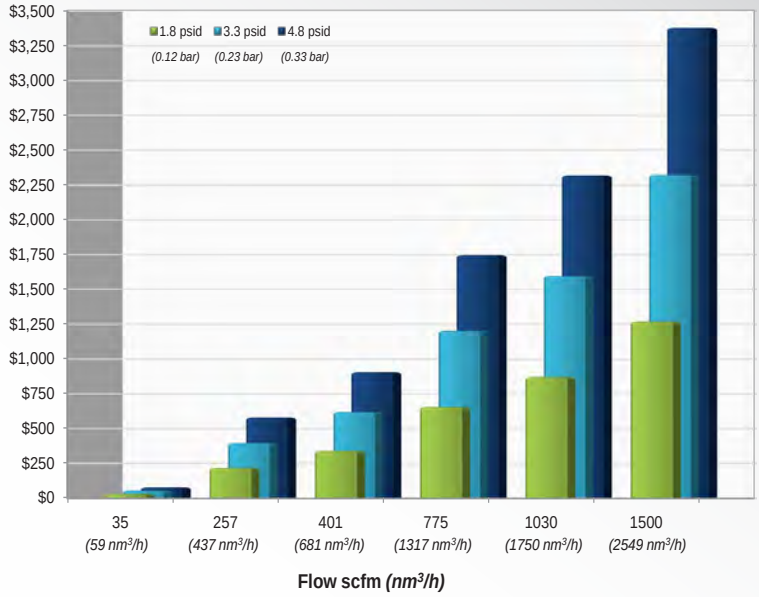
The development of sustainable energy savings compressed air treatment solutions is the driving principle behind Hankison product designs. The NGF Series provides the perfect balance between high performance filtration and low pressure drop. Patented filter elements (US 7,618,480 B2) maintain low pressure drop and long service life.

By minimizing resistance to flow, energy costs are significantly reduced. The example demonstrates the effect of pressure drop on operating costs.

Example:

- **Model: F15-HF high performance coalescing filter**
- **Flow: 1030 scfm (1750 nm³/h)**
  - » Hours of Operation: 8000 hours
  - » Operating Pressure: 101.5 psig (6.7 barg)
  - » Power Cost: $0.10/kWh
  - » Pressure Drop: 1.8 psid (0.12 barg)
  - » Cost of Pressure Drop: $870/yr
- **Under identical operation conditions, conventional filters maintain a higher cost of ownership:**
  - » Pressure Drop: 3.3 psid (0.23 barg)
  - » Cost of Pressure Drop: $1,596/yr
  - » Pressure Drop: 4.8 psid (0.33 barg)
  - » Cost of Pressure Drop: $2,321/yr

Annualized Cost of Pressure Drop



NGF Series Pressure Drop Performance*

Element Grade		Filter Description	Dry Δp		Wetted Δp	
			psig	barg	psig	barg
	SF	Bulk Liquid Separator/Filter	0.8	0.06	1.0	0.07
	PF	General Purpose Filter	0.6	0.04	1.4	0.10
	HF	High Efficiency Oil Removal Filter	0.6	0.04	1.8	0.12
	UF	Ultra High Efficiency Oil Removal Filter	0.8	0.06	2.0	0.14
	CF	Oil Vapor Removal Filter	1.0	0.07	-	-

**Pressure drop not to exceed stated values at ISO 12500 test conditions*

International Standards for Test and Measurement

ISO 12500

ISO 12500 defines a universal method for manufacturers to test and rate compressed air filters. Critical performance parameters are specified for inlet oil challenge and solid particulate size distribution.

- ISO 12500-1 defines the testing of coalescing filters for oil aerosol removal performance.
- ISO 12500-2 quantifies vapor removal capacity of adsorption filters.
- ISO 12500-3 outlines requirements to test particulate filters for solid contaminant removal.

The NGF Series is tested to ISO 12500. Test results provide certifiable performance data based on defined challenge concentrations.

NGF Series Filtration Performance

Element Grade	SF	PF	HF	UF	CF
Particle Retention Size[1] *(Per ISO 12500-3)*	3.0 µm	1.0 µm	0.01 µm	0.01 µm	0.01 µm
Particle Removal Efficiency *(Per ISO 12500-3)*	-	99.999+%	99.999+%	99.9999+%	99.999+%
Oil Removal Efficiency *(Per ISO 12500-1)*	50%	80%	99.9+%	99.99+%	–
Remaining Oil Content[2] *(Per ISO 12500-1)*	5.0 mg/m³	2.0 mg/m³	< 0.01 mg/m³	< 0.001 mg/m³	< 0.004 mg/m³ (as a vapor)

1 Solid particulate size distribution 0.01 to 5.0 µm
2 Inlet oil challenge concentration 10 mg/m³

And Compressed Air Quality

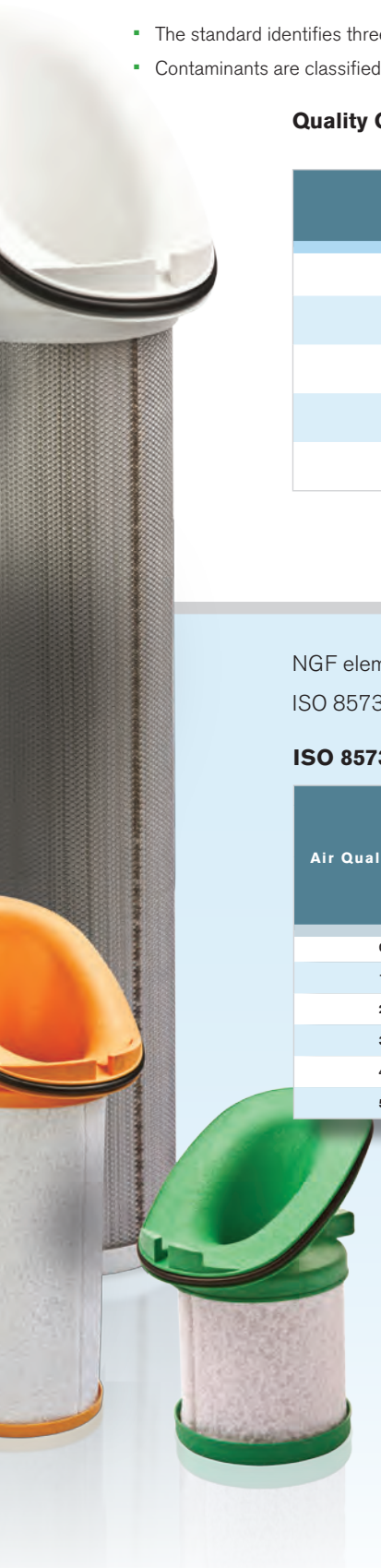
ISO 8573-1:2010 Air Quality Standard

ISO 8573-1, the international standard for compressed air quality, defines the amount of contamination permissible in compressed air.

- The standard identifies three primary forms of contamination in compressed air systems – solid particles, water and oil.
- Contaminants are classified and assigned a quality class, ranging from Class 0, the highest purity level, to Class 9, the most relaxed

Quality Class 8573-1: 2010

Element Grade	ISO Quality Class Solids	ISO Quality Class Oil
SF	3	5
PF	2	4
HF	1	1
UF	1	1
CF	1	1 (as a vapor)



NGF elements are performance validated to ISO 12500 ensuring air quality delivered is in accordance to ISO 8573-1: 2010 classifications

ISO 8573-1: 2010 Air Quality Classes

Air Quality Class	Solid Particles Maximum number of particles per m^3			Water Vapor Pressure Dew Point		Oil Total Oil Concentration: Aerosol, Liquid & Vapor	
	0.10 - 0.5 micron	0.5 - 1.0 micron	1.0 - 5.0 micron	°C	°F	mg / m^3	$ppm_{w/w}$
0	As specified by the equipment user or supplier and more stringent than class 1						
1	≦ 20,000	≦ 400	≦ 10	≦ -70	≦ -94	0.01	0.008
2	≦ 400,000	≦ 6,000	≦ 100	≦ -40	≦ -40	0.1	0.08
3	-	≦ 90,000	≦ 1,000	≦ -20	≦ -4	1	0.8
4	-	-	≦ 10,000	≦ +3	≦ +37	5	4
5	-	-	≦ 100,000	≦ +7	≦ +45	-	-

Patented Venturi-Wave™ Element

1 Patented Venturi-Wave™ Element Design

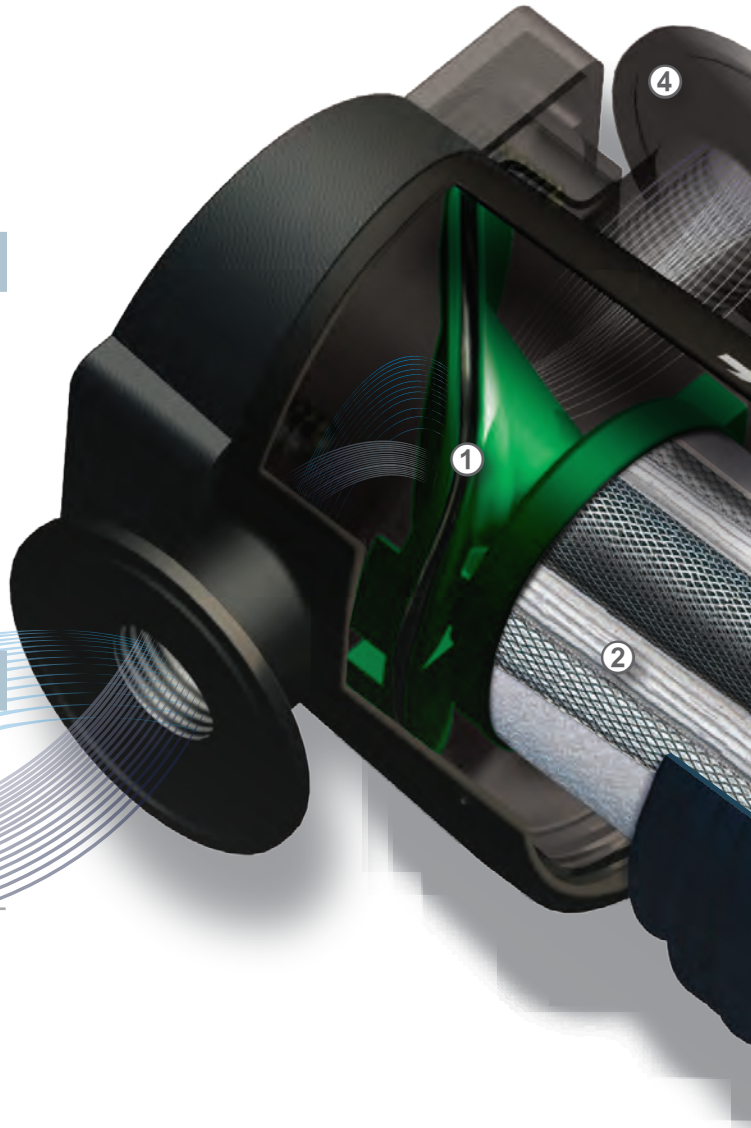
- The venturi profile promotes a turbulent-free transition for compressed air entering the element
- Optimized flow distribution through the element minimizes pressure loss and reduces system operating cost
- Unique backside contour assists smooth movement of air exiting the filter housing

2 Deep Bed Pleated, High Performance Media

- Increased effective filtration surface area, reduces pressure drop by 50%
- 96% voids-volume ratio optimizes dirt loading capacity
- HEPA grade micro fiberglass media maximizes efficiency
- Thermally bonded polyester support layers minimize media migration
- Low wetted pressure drop for the life of the element
- Seam welded, stainless steel inner and outer support cores enhance dimensional stability of the element
- Chemically inert, non-aging polyester drain layer expedites removal of liquid
- All materials of construction are silicone free

3 Element Grade Identification

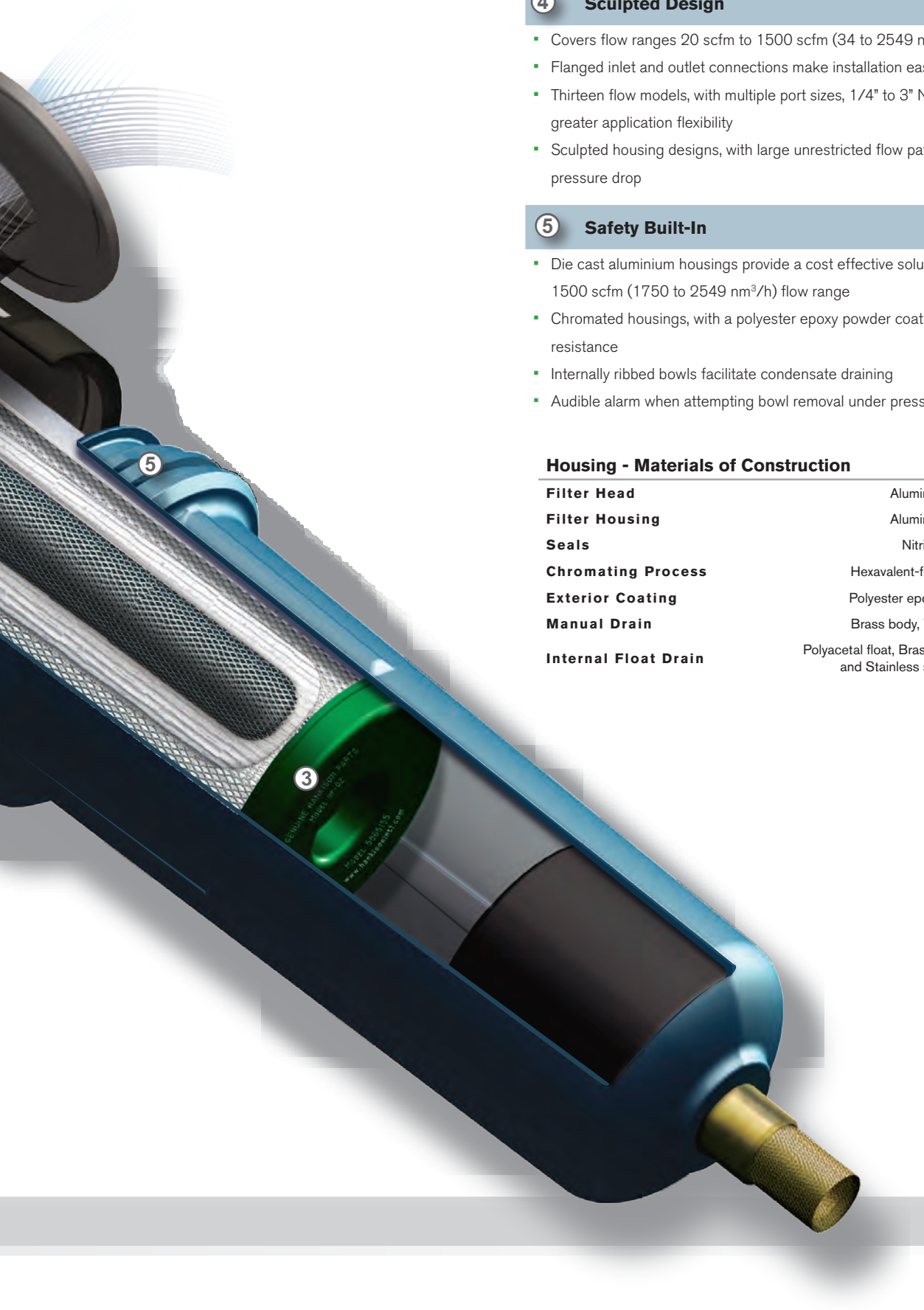
- Color coded end caps promote ease of element grade identification
- Bottom end caps pad printed with genuine Hankison filter element replacement part number



Element - Materials of Construction

Filter Media	HEPA grade borosilicate fiberglass
Inner/Outer Support Cores	400 Series stainless steel
Drainage Layer	Filtration grade polyester
End Caps	Fiberglass reinforced polyamide resin
Bonding Agent	Polyurethane
End Cap Seal	Nitrile

And Optimized Housing Design



4 Sculpted Design

- Covers flow ranges 20 scfm to 1500 scfm (34 to 2549 nm^3/h)
- Flanged inlet and outlet connections make installation easy
- Thirteen flow models, with multiple port sizes, 1/4" to 3" NPT, allow for greater application flexibility
- Sculpted housing designs, with large unrestricted flow paths, reduce pressure drop

5 Safety Built-In

- Die cast aluminium housings provide a cost effective solution in the 1030 to 1500 scfm (1750 to 2549 nm^3/h) flow range
- Chromated housings, with a polyester epoxy powder coating for corrosion resistance
- Internally ribbed bowls facilitate condensate draining
- Audible alarm when attempting bowl removal under pressure

Housing - Materials of Construction

Filter Head	Aluminum
Filter Housing	Aluminum
Seals	Nitrile
Chromating Process	Hexavalent-free trivalent
Exterior Coating	Polyester epoxy powder
Manual Drain	Brass body, Viton® seal
Internal Float Drain	Polyacetal float, Brass body, Viton® seal and Stainless steel springs

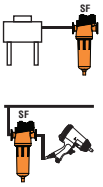
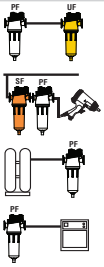
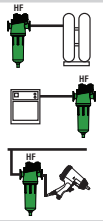
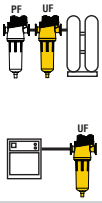
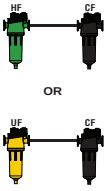
Total System Protection

The NGF Series provides protection for the entire compressed air system. A wide range of filters exceeds customer requirements for ISO Quality Class performance, service life and optimal energy savings.

Compressed air contamination exists in three states- solid, liquid and gaseous.

- Ingested contaminants appear in the form of water, hydrocarbons and particulates.
- The compression process introduces lubricant and wear particles into the system.
- Piping distribution and storage tanks foster contaminants in the form of rust, pipe scale and bacteria.

NGF Series Element Specifications

	Element Grade	Description	ISO Performance Data	Where Applied	
	Grade SF Bulk Liquid Separator/Filter	Separator/filter removes bulk liquid and solids.	▪ Removes solids 3 micron and larger ▪ Remaining oil content 5 mg/m^3 **ISO 8573-1: 2010 Air Quality Class:** ▪ Solid Particles - Class 3 ▪ Remaining Oil Content - Class 5	Downstream of aftercoolers At point-of-use if no aftercooler/ separator used upstream	
	Grade PF General Purpose Filter	General purpose filtration to protect pneumatically operated tools, motors and cylinders.	▪ Removes solids 1.0 micron and larger ▪ Remaining oil content 2.0 mg/m^3 **ISO 8573-1: 2010 Air Quality Class:** ▪ Solid Particles - Class 2 ▪ Remaining Oil Content - Class 4	Upstream of ultra high efficiency oil removal filters At point-of-use if aftercooler/separator installed upstream Downstream of heatless desiccant dryers Upstream of refrigerated dryers	
	Grade HF High Efficiency Oil Removal Filter	Fine coalescer provides oil free air for industrial applications such as spray painting, injection molding, instrumentation and control valves.	▪ Removes 99.999+% of solids 0.01 micron and larger ▪ Remaining oil content < 0.01 mg/m^3 **ISO 8573-1: 2010 Air Quality Class:** ▪ Solid Particles - Class 1 ▪ Remaining Oil Content - Class 1	Upstream of desiccant dryers Downstream of refrigerated dryers At point-of-use if aftercooler/separator installed upstream	
	Grade UF Ultra High Efficiency Oil Removal Filter	Ultra fine coalescer delivers oil free air for critical applications including, conveying, electronics manufacturing and nitrogen replacement.	▪ Removes 99.9999+% of solids 0.01 micron and larger ▪ Remaining oil content< 0.001 mg/m^3 **ISO 8573-1: 2010 Air Quality Class:** ▪ Solid Particles - Class 1 ▪ Remaining Oil content - Class 1	Upstream of desiccant dryers Upstream of membrane dryers *(Use a PF Grade as a prefilter if heavy liquid loads are present)* Downstream of refrigerated dryers	
	Grade CF Oil Vapor Removal Filter	Activated carbon filter removes oil vapor and provides oil free air for food and drug manufacturing, breathing air and gas processing.	▪ Removes solids 0.01 micron and larger ▪ Remaining oil content < 0.004 mg/m^3 (as a vapor) **ISO 8573-1: 2010 Air Quality Class:** ▪ Solid Particles - Class 1 ▪ Remaining Oil Content - Class 1	Downstream of high efficiency oil removal filters	

Accessories and Options

The NGF Series is supported by a complete line of accessories and options making filter installation and differential pressure monitoring easy.

Installation Flexibility

Filter Connector Clamps

Stainless steel clamps easily connects filters in series

- *Optional (02-17)*

Wall Mount Bracket

Rugged design provides installation flexibility

- *Optional (02-17)*

Pressure Monitoring

Differential Pressure Slide Indicator

Color indicator moves based on differential pressure

- *Standard SF, PF, UF, HF grades (02-07)*

Differential Pressure Gauge

Two color gauge face indicates element change-out based on differential pressure

- *Standard SF, PF, UF, HF grades (08-17)*

Electronic Filter Monitor

Predicts the optimal time to change the element

- *Optional (02-17)*

Condensate Management

Manual Drain

Condensate may be drained manually through clockwise adjustment

- *Standard CF grade (02-12)*
- *Optional SF, PF, UF, HF grades (02-12)*

No Air Loss Internal Float Drain

Effectively removes condensate without loss of air

- *Standard SF, PF, UF, HF grades (02-12)*
- *Optional CF grade (02-12)*

No Air Loss Mechanical Drain

Reliably removes condensate without need for electricity

- *Optional (14-17)*

Filter Selection

Model Configuration

F ① - ② - ③

① Housing-Connection-Flow

Model	Connection* in	Flow @ 100 psig scfm	Flow @ 6.7 barg nm³/h
02	1/4"	20	34
03	3/8"	35	59
04	1/2"	50	85
06	3/4"	75	127
07	3/4"	103	175
08	1	157	267
10	1 1/2"	257	437
11	1 1/2"	360	612
12	2"	401	681
13	2 1/2"	568	965
14	2 1/2"	775	1317
15	2 1/2"	1030	1750
16	3"	1200	2039
17	3"	1500	2549

**BSP threads are available. Add B to the model number. Example F02B-SF-DP1*

② Element Grade

SF	Bulk Liquid Removal
PF	Particulate Removal
HF	Oil Removal
UF	High Efficiency Oil Removal
CF	Oil Vapor Removal

③ Options

T	Drain Plug
D	Internal Automatic Drain
P1	Differential Pressure Slide Indicator
G1	Differential Pressure Gauge
M	Electronic Filter Monitor
X	External Drain Adapter (02-12)
W	External Mechanical Drain (14-17)

Example: F02-SF-DP1

Flow and Connection: 20 scfm (34 nm³/h); 1/4" NPT
Element Grade: SF- bulk liquid removal
Options: Internal automatic drain; differential pressure slide indicator

Capacity Correction Factors

NGF Series flow capacities are rated per ISO 12500 conditions @ 100 psig (6.7 barg). To size the filter for non-standard conditions, a correction factor must be applied. Table 1 provides correction factors for inlet air pressure.

Do not select filters by pipe size; use flow rate and operating pressure.

Table 1 - Correction Factors for Inlet Pressure

Inlet Pressure	psig	20	30	40	60	80	100	120	150	200	250	300
	barg	1.4	2.1	2.8	4.1	5.5	6.9	8.3	10.3	13.8	17.2	20.7
Correction Factor		0.30	0.39	0.48	0.65	0.82	1.00	1.17	1.43	1.87	2.31	2.74

Adjusted Flow Capacity

To calculate the flow capacity based on non-standard inlet conditions, multiply the filter's rated flow capacity by the corresponding inlet pressure correction factor.

High Efficiency Coalescing Filter: F04-HF-DP1

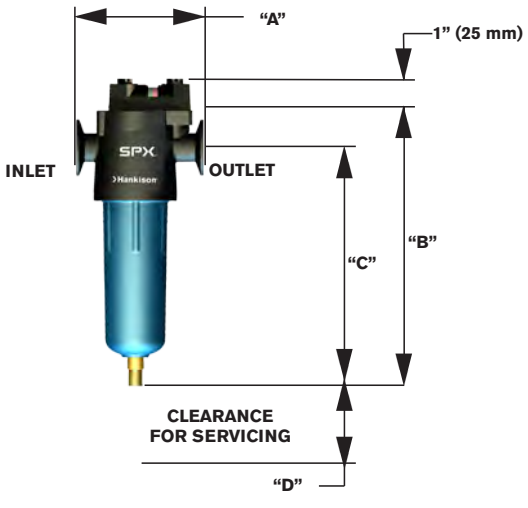
Rated capacity: 50 scfm (85 nm³/h)

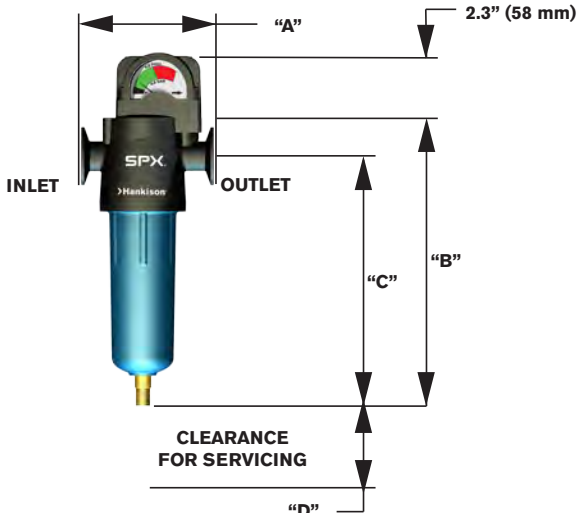
Operating Conditions: 120 psig (8.3 barg)

Adjusted Flow Capacity: 50 scfm x 1.17= 59 scfm (100 nm³/h)

Product Specifications

Model	Capacity @ 100 psig (6.7 barg)		Inlet/Outlet Connections	Dimensions				Weight
	scfm	nm^3/h	in	"A" in	"B" in	"C" in	"D" in	lbs
F02	20	34	1/4" NPT	4.5	8.1	6.8	4.0	1.8
F03	35	59	3/8" NPT	4.5	8.1	6.8	4.0	1.8
F04	50	85	1/2" NPT	4.5	9.9	8.5	4.0	1.9
F06	75	127	3/4" NPT	5.2	10.3	8.7	5.0	3.1
F07	103	175	3/4" NPT	5.2	10.3	8.7	5.0	3.1
F08	157	267	1" NPT	5.2	12.8	11.7	5.0	3.5
F10	257	437	1 1/2" NPT	7.9	13.3	10.9	7.0	8.4
F11	360	612	1 1/2" NPT	7.9	17.1	14.7	7.0	9.9
F12	401	681	2" NPT	7.9	22.3	19.9	7.0	11.6
F13	568	965	2 1/2" NPT	9.1	24.9	21.7	8.0	18.6
F14	775	1317	2 1/2" NPT	9.1	24.9	21.7	8.0	18.6
F15	1200	2039	2 1/2" NPT	9.1	24.9	21.7	8.0	18.6
F16	1200	2039	3" NPT	9.1	32.2	28.9	8.0	27.7
F17	1500	2549	3" NPT	9.1	42.7	39.4	8.0	41.3





Technical Specifications

Drain Option	Maximum Operating Pressure	*Maximum Operating Temperature	Minimum Operating Temperature
Drain Plug	250 psig (17.2 barg)	150°F (66°C)	35°F (2°C)
Internal Float	250 psig (17.2 barg)	150°F (66°C)	35°F (2°C)
Externally Mounted Mechanical	150 psig (10.3 barg)	120°F (49°C)	35°F (2°C)

NGF Series

20 to 1500 scfm

(34 to 2459 nm³/h)

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