

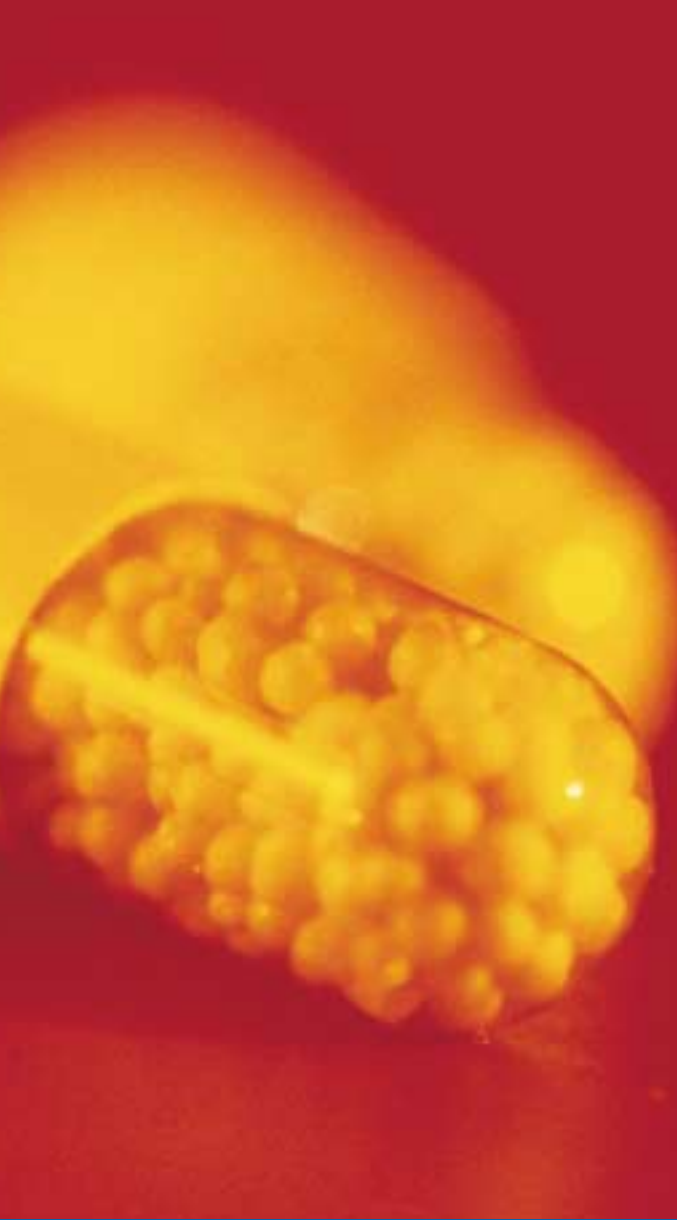


# WORLD CLASS FILTRATION

20 - 21,250  
SCFM

**CFF SERIES**  
COMPRESSED AIR  
FILTERS





**CHAMPION**

20—21,250 SCFM

**CFF SERIES**

COMPRESSED AIR FILTERS

COMPRESSED AIR FILTER

# CFF Series Filters provide your compressed air system with premium quality filtration for the three typical contaminant types

- 1) Solid particles come from ambient air contaminants like dust and from rusted, oxidized pipework. They will cause pneumatic equipment to malfunction, cause instrument and control failures, and contaminate end products.
- 2) Condensed water droplets come from the humidity in ambient air. Water will oxidize pipework and pneumatic equipment, ruin paint finishes and end products.
- 3) Liquid oil and oil vapors are introduced by compressor lubricants and by hydrocarbon vapors present in ambient air. Oil-free compressed air is particularly important in food and pharmaceutical processes.

## World Class Filtration

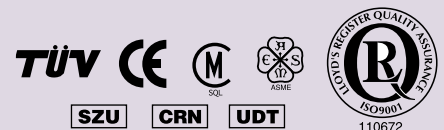
**SEVEN FILTRATION GRADES PROVIDE ISO 8573.1 STANDARD AIR QUALITY**

Filter Grade	Description	Filtration*			ISO 8573.1 Quality Classes***	
		Water Droplets** ppm w/w	Solid Particulates micron	Oil Removal ppm w/w	solids	oil
A	Water Separator	30,000	-	-	-	-
B	Separator/Filter	25,000	3	5	3	5
C	General Purpose	2,000	1	1	2	4
D	Dry Particulate	-	1	-	2	-
E	High Efficiency Oil Removal	1,000	0.01	0.008	1	1
F	Maximum Efficiency Oil Removal	100	0.01	0.0008	1	1
G	Oil Vapor Removal	-	0.01	0.003	1	1

\* Tested to CAGI ADF400 and ADF500  
 \*\* Maximum inlet liquid load  
 \*\*\* Complete ISO 8573.1 Reference Table on page 5

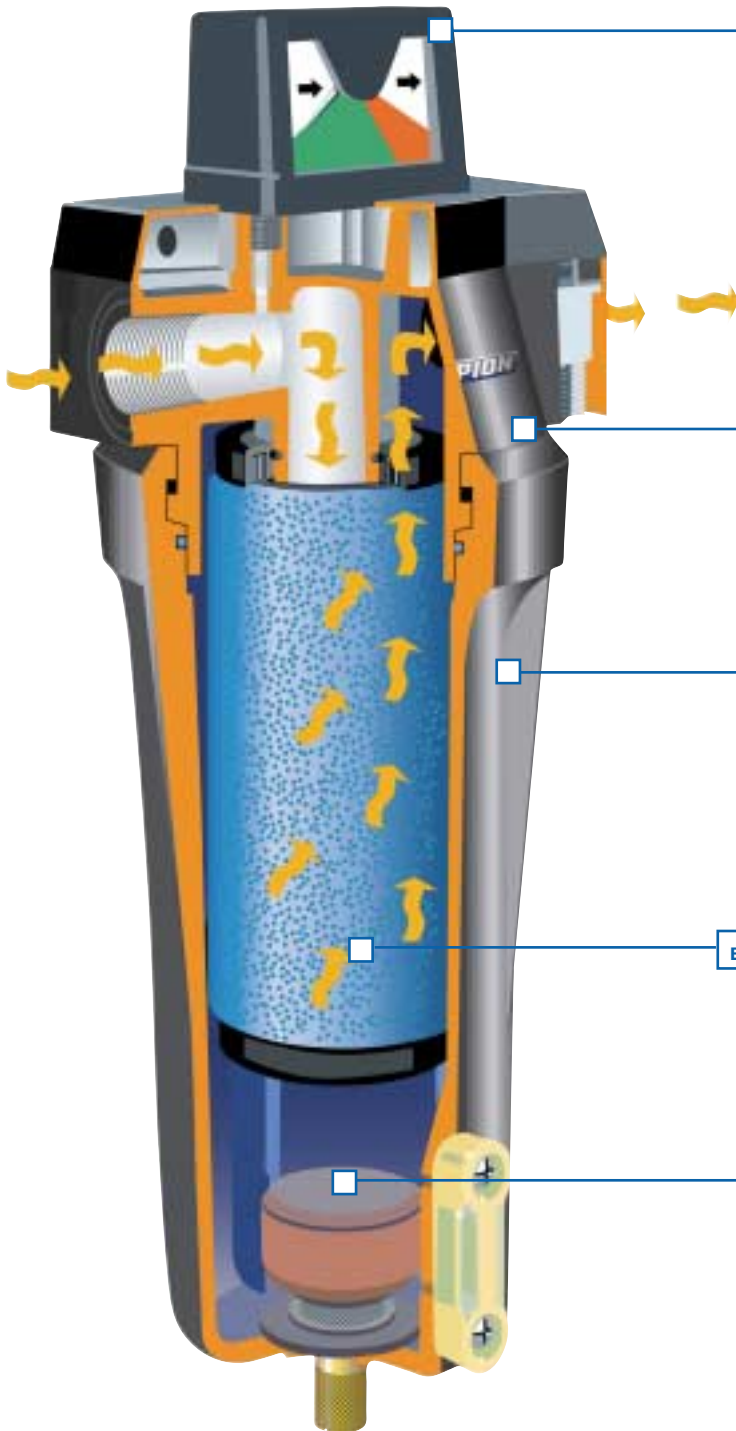
### COMPLY WITH PRESSURE VESSEL DIRECTIVES WORLDWIDE

CFF Series Filters utilize housings which conform to most major pressure vessel directives in the Americas, Europe, and Asia.



# FEATURES

AN INNOVATIVE DESIGN FOR ALL APPLICATIONS



## SLIDE INDICATOR

Standard on 20 - 60 scfm models  
Changes color based on differential pressure



## GAUGE

Standard on 100 - 21,250 scfm models  
Dual gauge face allows housings to be mounted  
in any flow direction  
Indicates element change-out based on differential pressure  
Large easy-to-read gauge face  
Remote mounting possible



## ENERGY SAVING ELEMENT MONITOR

Optional on grades B through G  
Three modes determine element change: time,  
differential pressure, element performance

## SIMPLE MAINTENANCE

1/8" turn, self-locking bayonet head to  
bowl connection (up through 1" connection sizes)  
Audible warning by escaping air if housing  
is not depressurized before disassembly  
Ribbed bowls allow use of C-spanner  
Color-coded elements for easy identification

## MODULAR HOUSINGS SAVE SPACE AND TIME

Standard on 20 - 780 scfm models  
Large flow paths reduce pressure drop  
Chromated and epoxy powder painted (interior and  
exterior) add durability and corrosion resistance  
MWP 300 psig (21 bar)  
Can be mounted for left or right entry  
High-quality aluminum, zinc, and steel materials

## ELEMENT GRADES OFFER SUPERIOR FILTRATION

Large effective surface areas ensure high capture rates  
Large open areas minimize pressure drop  
Silicone-free, withstand temperatures to 150°F (66°C)  
Push-on elements for quick replacement  
Corrosion resistant, stainless steel cores

## INTERNAL AUTOMATIC DRAINS

Reliable discharge of condensate  
Pilot operated, pneumatically actuated,  
particulate-resistant mechanism  
Viton seals and inlet screen for  
additional protection

# FILTER ELEMENTS FOR ALL GRADES OF FILTRATION

Compressed air systems continually challenge filtration with moisture, solid particulates, and liquid oil or oil vapors. CFF Series filter elements represent state-of-the-art filter designs which allow for custom filtration at every installation.

Inside-to-out air flow maximizes filtration efficiency

Two-stage filtration ensures long element life

Stainless steel inner and outer cores add structural integrity

Uniquely blended coalescing fiber media design

Coated foam sleeves provide protection against chemical attack

100% silicone free, withstand temperatures to 150°F (66°C)

## GRADE A - WATER SEPARATOR

Installation: after an air compressors' (or a stand-alone) aftercooler

Design: One-stage filtration with two stainless steel orifice tubes. Labyrinth style air flow path removes liquid water by forcing abrupt directional changes.

Performance\*: Handles bulk liquid inlet loads to 30,000 ppm w/w and provides 10 micron solid particulate separation. Efficient to flows as low as 5% of rated flow.



## GRADE B - SEPARATOR/FILTER

Installation: after an air compressors' (or a stand-alone) aftercooler or as a prefilter to a refrigerated dryer

Design: Two-stage filtration with first stage of two stainless steel orifice tubes which remove bulk liquids and solid particulates to 10 micron. Second stage has in-depth coalescing fiber media which captures solid particulates to 3 micron.

Performance\*: Handles bulk liquid inlet loads to 25,000 ppm w/w and provides 3 micron solid particulate filtration.



## GRADE C - GENERAL PURPOSE FILTER

Installation: 1 micron particulate prefilter for refrigerated dryers and high efficiency oil removal filters.

Design: Two-stage filtration with a first stage of multiple layers of fiber media which pre-filter the air. Second stage has in-depth coalescing fiber media which coalesces oil aerosols and removes finer particulates to 1 micron.

Performance\*: Handles bulk liquid inlet loads to 2,000 ppm w/w, provides 1 micron solid particulate filtration and oil removal to 1 ppm.



## GRADE D - DRY PARTICULATE FILTER

Installation: Dry, solid particulate afterfilter for heatless desiccant dryers

Design: Two-stage filtration with life-prolonging outside/in air flow with first stage of alternate layers of fiber media and a media screen capturing large particulates.

Second stage captures finer particulates. Not designed for any liquid loading.

Performance\*: Provides 1 micron solid particulate filtration of desiccant dust.



## GRADE E - HIGH EFFICIENCY OIL REMOVAL FILTER

Installation: Prefilter to desiccant and membrane dryers, afterfilter to refrigerated dryers and stand-alone oil removal at the point-of-use of compressed air.

Design: Two-stage filtration with a first stage of multiple layers of fiber media which prefilter the air. Second stage has in-depth coalescing fiber media which coalesces oil aerosols. Includes an outer-coated, closed cell foam sleeve.

Performance\*: Handles bulk liquid water inlet loads to 1,000 ppm w/w and provides 0.008 ppm oil aerosol removal and 0.01 micron solid particulate separation.



## GRADE F - MAXIMUM EFFICIENCY OIL REMOVAL FILTER

Installation: Prefilter to desiccant and membrane dryers with a Grade C prefilter, oil-free air applications.

Design: Two-stage filtration with a first stage of a coated, closed-cell foam sleeve which acts as a prefilter and flow disperser. Second stage has in-depth coalescing fiber media which coalesces fine oil aerosols. Includes an outer-coated, closed cell foam sleeve.

Performance\*: Handles bulk liquid water inlet loads to 100 ppm w/w and provides 0.0008 ppm oil aerosol removal and 0.01 micron solid particulate separation.



## GRADE G - OIL VAPOR REMOVAL FILTER

Installation: Afterfilter to high efficiency liquid oil removal filters for true oil-free applications.

Design: Two-stage filtration with a generously-sized first stage of a stabilized bed of carbon particles which remove the majority of the oil vapor. Second stage has multiple layers of fiber media with bonded microfine carbon particles which remove the remaining oil vapors. Includes an outer-coated, closed cell foam sleeve which prevents fiber migration.

Performance\*\*: No liquid should be present at filter inlet. Provides 0.003 ppm w/w oil (as a vapor) removal and 0.01 micron solid particulate separation.



\* Filter efficiencies have been established in accordance with CAGI standard ADF400 and are based on 100°F (38°C) inlet temperature

\*\* Filter efficiency has been established in accordance with CAGI standard ADF500 and is based on 100°F (38°C) inlet temperature



## ISO 8573.1 QUALITY CLASSES

ISO 8573.1 was developed in 1992 by ISO (International Organization for Standardization) to help plant engineers specify desired compressed air quality globally by providing “Quality Classes” for solid particulates, humidity and oil. Quality classes provide engineers with an internationally accepted unit of measure. A typical pharmaceutical plant, for example, would have a compressed air specification of ISO Quality Classes 1.2.1. This is equivalent to 0.1 micron particulate filtration, -40°F (-40°C) dew point, and 0.008 ppm (0.01 mg/m<sup>3</sup>) oil filtration.

No matter what language is spoken and what unit of measure is used, using ISO 8573.1 Air Quality Classes ensures that your factory will get the compressed air quality you specified.

Quality Classes	Solid Contaminants (maximum particle size in microns)	Maximum Pressure Dew Points °F (°C)	Maximum Oil Content (droplets, aerosols, and vapor) ppm w/w (mg/m <sup>3</sup> )
1	0.1	-94 (-70)	0.008 (0,01)
2	1	-40 (-40)	0.08 (0,1)
3	5	-4 (-20)	0.8 (1)
4	15	38 (3)	4 (5)
5	40	45 (7)	21 (25)
6	-	50 (10)	-

## AIR QUALITY/PRESSURE DROP TABLE

Filter Grade	Description	Pressure Drop at Rated Conditions psid (kgf/cm <sup>2</sup> )	
		dry	wet
A	Water Separator	0.8 (0.06)	0.8 (0.06)
B	Separator/Filter	1 (0.07)	1.5 (0.11)
C	General Purpose	1 (0.07)	2 (0.14)
D	Dry Particulate	1 (0.07)	-
E	High Efficiency Oil Removal	1 (0.07)	3 (0.21)
F	Max. Efficiency Oil Removal	2 (0.14)	6 (0.42)
G	Oil Vapor Removal	1 (0.07)	-



20 - 21,250 SCFM

CFF SERIES

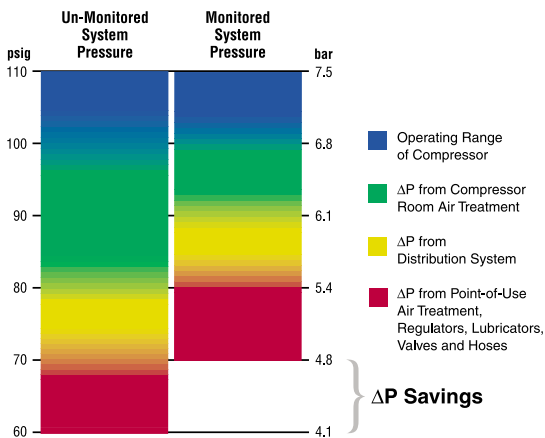
COMPRESSED AIR FILTERS



# ELEMENT MONITOR PROVIDES ENERGY SAVINGS

Champion focuses on maximizing the efficiencies of the entire compressed air system. CFF Series Filters feature an optional Element Monitor which focuses on reducing system pressure drop. Reducing system pressure drop has several benefits:

- reduces air compressor kW consumption
- reduces operating expenses
- prolongs air compressor life



The Element Monitor allows the user to control the exact amount of pressure drop incurred from compressed air filter elements. Unlike traditional mechanical gauges which give color indications typically when pressure drop has reached the 10 to 12 psig (0.7 to 0.8 bar) range, the Element Monitor will provide warnings to change the element at the 5 to 6 psig (0.3 to 0.4 bar) range - 60 days before pressure drop starts spiraling up. This 60 day notice give plant maintenance ample time to order and install a replacement filter element. A state-of-the-art microprocessor is the core technology of the Element Monitor. The microprocessor technology allows the Element Monitor to perform three monitoring modes.

**TIME MONITORING MODE** – Simply input the number of months until filter change-out to match preventative maintenance schedules. The range is 1 to 15 months, the factory default setting is 12 months. Many sensitive end use applications recommend maintenance schedules for filter elements to guarantee oil-free air.

**Δ P MONITORING MODE** – Control system pressure drop by entering maximum allowable pressure drop across the element. Simply input within the range of 0.1 to 15 psig (0.01 to 1 bar), the factory default setting is 6 psig (0.4 bar). The Element Monitor is programmed to ignore momentary pressure drop spikes and thereby avoids false alarms.

**ELEMENT PERFORMANCE MODE** – Receive a 60-day warning before the element gets loaded with particulates and pressure drop starts its' upward spiral. This mode will develop a "particulate loading profile" and forecast out when the element should be changed. The microprocessor, which first allows the element to become "wetted" and therefore stabilized, takes measurements of instantaneous pressure drop over 1,800 times per hour during the first 8 day period upon element installation. This develops a "particulate loading profile" which is unique to the end user. This profile is then used to forecast the optimal time for element replacement and triggers a "60-day countdown to optimal element replacement" which flashes every six seconds on the Element Monitor LCD.

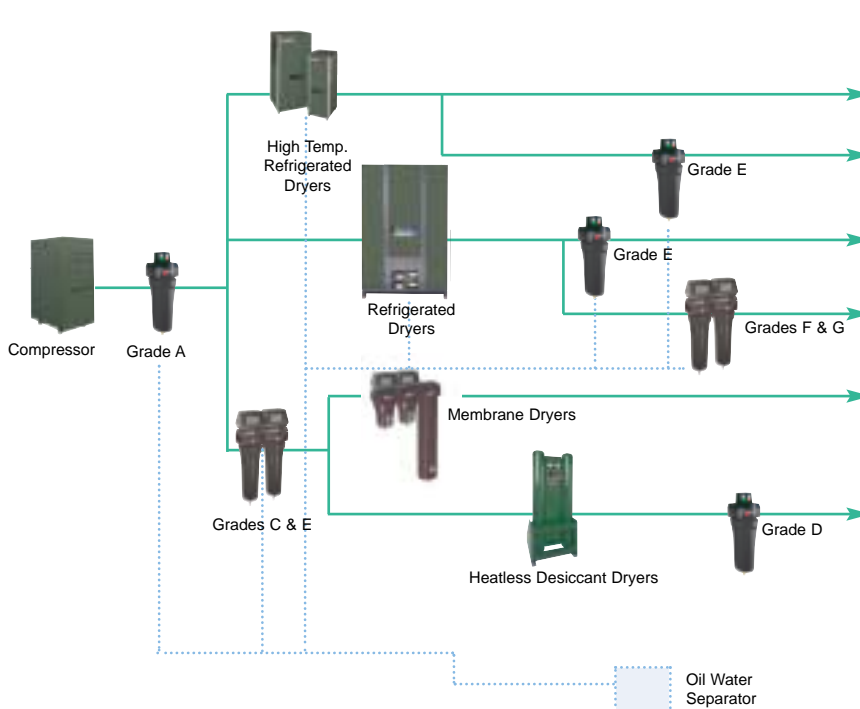
**SIMPLE OPERATION** – The Element Monitor is designed for on-board manual programming without the need for any external instruments or programs. The programs utilize easy to understand international units of measure. The LCD display automatically cycles readings on instantaneous differential pressure, average differential pressure, and remaining days until element replacement every six seconds. For easy maintenance, the Element Monitor runs on three off-the-shelf AA batteries and the operator alert light signals the need for element replacement or a low battery condition.

- Element monitor available one grades B through G



# MAINTAIN SYSTEM PRESSURE BY CREATING A CUSTOM AIR TREATMENT SYSTEM

Champion Air Treatment offers solutions to all air treatment applications. Maximize system pressure by choosing the combination of Champion air treatment products which perfectly match your applications' requirements.



ISO 8573.1 Air Quality Class			System	ΔP*
Solids	Moisture	Oil	psi	bar
3	6	5	<5	<0,35
Body shops, sand blasting				
1	6	1	<8	<0,56
Large pneumatic tools, spray painting				
1	4	1	<8	<0,56
Powder painting, fine pneumatic tools, air gauging & conveying, pneumatic instruments & controls				
1	4	1	<11	<0,75
Food packaging, cosmetics, photo labs, textile looms				
1	2-5	1	<10	<0,68
Telephone cable, printing, photo labs, spray painting, dental, laboratory instruments				
1	1-3	1	<10	<0,68
Air lines exposed to freezing ambient conditions, pharmaceutical, chemical, powder paint				
1	2-3	1	<15	<1,02
Food processing, dairies, breweries, air in direct contact with foods, microchips, optics, medicines, point-of-use filtration				

\* Efficiencies per CAGI standards ADF100 and ADF400 and wetted element conditions.

### Filter Grades

- A - Mechanical Separator (bulk liquid)
- B - Separator/Filter (3 micron and bulk liquid)
- C - Air Line Filter (1 micron)
- D - Dry Desiccant Afterfilter (1 micron)
- E - High Efficiency Oil Removal Filter (0.008 ppm)
- F - Maximum Efficiency Oil Removal Filter (0.008 ppm)
- G - Oil Vapor Removal Filter (activated carbon)

### Features:

- D - Internal Automatic Drain Mechanism
- E - Electric Demand Drain
- P - Differential Pressure Slide Indicator
- G - Differential Pressure Gauge Indicator
- L - Liquid Level Indicator
- S - Corrosion Proof Stainless Steel element
- M - Element Monitor

MODEL	CAPACITY SCFM (M <sup>3</sup> /MIN)	CONNECTIONS NPT/ANSI FLG.	STANDARD FEATURES					MAX PRESSURE PSIG (KGf/CM <sup>2</sup> ) AND TEMP °F (°C)		DIMENSIONS			REPLACEMENT ELEMENT	
			FILTER GRADES					MANUAL DRAIN	WITH D OR L	HEIGHT IN (MM)	WIDTH IN (MM)	WEIGHT LB (KG)	ELEMENT	
			A	B	C,E,F	D	G						MODEL	QTY.
<b>MODULAR TYPE HOUSINGS</b>														
CFF20(Grade)(Features)	20 (0.57)	3/8" NPTF		D	D				8.15 (207)	4.13 (105)	4.2 (1.9)	C20(Grade)E		
CFF35(Grade)(Features)	35 (1.00)	1/2" NPTF	D	P	P			11.05 (281)	4.13 (105)	8.1 (3.7)	C35(Grade)E			
CFF60(Grade)(Features)	60 (1.72)	1/2" NPTF						13.4 (340)	4.13 (105)	8.5 (3.9)	C60(Grade)E			
CFF100(Grade)(Features)	100 (2.9)	3/4" NPTF	D	D				15.32 (389)	5.25 (133)	6.3 (2.9)	C100(Grade)E			
CFF170(Grade)(Features)	170 (4.9)	1" NPTF		G	D			19.57 (497)	5.25 (133)	6.9 (3.1)	C170(Grade)E			
CFF250(Grade)(Features)	250 (7.2)	1 1/2" NPTF		G	G			22.8 (579)	6.44 (164)	10.2 (4.6)	C250(Grade)E	1		
CFF375(Grade)(Features)	375 (11)	1 1/2" NPTF	(1)	(1)				27.29 (693)	6.44 (164)	11.3 (5.1)	C375(Grade)E			
CFF485(Grade)(Features)	485 (14)	2" NPTF		G	D			31.08 (789)	7.63 (194)	28 (12.7)	C485(Grade)E			
CFF625(Grade)(Features)	625 (18)	2 1/2" NPTF	(1)	(1)	G			36.83 (935)	7.63 (194)	33 (15.0)	C625(Grade)E			
CFF780(Grade)(Features)	780 (22)	2 1/2" NPTF						42.96 (1091)	7.63 (194)	38 (17.2)	C780(Grade)E			
<b>PRESSURE VESSELS</b>														
CFF625P(Grade)(Features)	625 (18)	3" NPTM	D	D	D	G		300 psig 21 kgf/cm <sup>2</sup>	300 psig 21 kgf/cm <sup>2</sup>	40.88 (1038)	10.25 (260)	36 (16.3)	CP(Grade)E	1
CFF1000(Grade)(Features)	1,000 (29)	3" NPTM						225 psig 15.8 kgf/cm <sup>2</sup>	225 psig 15.8 kgf/cm <sup>2</sup>	48.00 (1219)	16.00 (406)	91 (41.3)	C1000(Grade)E	
CFF1250(Grade)(Features)	1,250 (36)	3" NPTM					48.00 (1219)			16.00 (406)	91 (41.3)	CP(Grade)E	2	
CFF1875(Grade)(Features)	1,875 (54)	3" NPTM						49.00 (1245)	16.25 (413)	120 (54.4)	CP(Grade)E	3		
CFF2500(Grade)(Features)	2,500 (72)	4" flg.						52.25 (1327)	20.00 (508)	179 (81.2)	CP(Grade)E	4		
CFF3125(Grade)(Features)	3,125 (89)	4" flg.	(1)	G	G	G		52.25 (1327)	20.00 (508)	182 (82.6)	CP(Grade)E	5		
CFF5000(Grade)(Features)	5,000 (143)	6" flg.		(1)	(1)			150°F 66°C (3)	150°F 66°C (3)	54.63 (1387)	24.00 (610)	271 (123)	CP(Grade)E	8
CFF6875(Grade)(Features)	6,875 (197)	6" flg.						62.56 (1589)	28.00 (711)	518 (235)	CP(Grade)E	11		
CFF8750(Grade)(Features)	8,750 (250)	6" flg.						62.56 (1589)	28.00 (711)	527 (239)	CP(Grade)E	14		
CFF11875(Grade)(Features)	11,875 (340)	8" flg.						69.13 (1756)	33.00 (838)	709 (322)	CP(Grade)E	19		
CFF16250(Grade)(Features)	16,250 (465)	8" flg.						67.94 (1726)	39.00 (991)	918 (416)	CP(Grade)E	26		
CFF21250(Grade)(Features)	21,250 (608)	10" flg.						70.94 (1802)	45.88 (1165)	1412 (640)	CP(Grade)E	34		

- (1) Drain plugs standard. Externally mounted automatic drains are available.
- (2) Time-based Element Monitor recommended
- (3) ASME coded pressure vessels

# ORDERING INFORMATION

## FILTER GRADES

- A - Mechanical Separator (bulk liquid)
- B - Separator/Filter (3 micron and bulk liquid)
- C - Air Line Filter (1 micron)
- D - Dry Desiccant Afterfilter (1 micron)
- E - High Efficiency Oil Removal Filter (0.008 ppm)
- F - Maximum Efficiency Oil Removal Filter (0.0008 ppm)
- G - Oil Vapor Removal Filter (activated carbon)

HOUSING		CONNECTION
Number	Capacity scfm (m <sup>3</sup> /min) @ 100 psig (7 kgf/cm <sup>2</sup> )	SIZES* NPT/ANSI flg.
<b>MODULAR HOUSINGS</b>		
20	= 20 (0.57)	3/8" NPTF
35	= 35 (1.00)	1/2" NPTF
60	= 60 (1.72)	1/2" NPTF
100	= 100 (2.9)	3/4" NPTF
170	= 170 (4.9)	1" NPTF
250	= 250 (7.2)	1-1/2" NPTF
375	= 375 (11)	1-1/2" NPTF
485	= 485 (14)	2" NPTF
625	= 625 (18)	2-1/2" NPTF
780	= 780 (22)	2-1/2" NPTF
<b>PRESSURE VESSELS</b>		
625P	= 625 (18)	3" NPTM
1000	= 1000 (29)	3" NPTM
1250	= 1250 (36)	3" NPTM
1875	= 1875 (54)	3" NPTM
2500	= 2500 (72)	4" flg.
3125	= 3125 (89)	4" flg.
5000	= 5000 (143)	6" flg.
6875	= 6875 (197)	6" flg.
8750	= 8750 (250)	6" flg.
11875	= 11875 (340)	8" flg.
16250	= 16250 (465)	8" flg.
21250	= 21250 (608)	10" flg.

## FEATURES:

- D - Internal Automatic Drain Mechanism
- E - Electric Demand Drain
- P - Differential Pressure Slide Indicator
- G - Differential Pressure Gauge Indicator
- L - Liquid Level Indicator
- S - Corrosion Proof Stainless Steel element
- M - Element Monitor

Example 1: To order a Grade E High Efficiency Oil Removal filter with a capacity of 100 scfm (3/4" NPTF connections), integral automatic drain, differential pressure gauge, and liquid level indicator would be configured as: CFF100EDGL

Example 2: A replacement element for a CFF100EDGL filter is C100EE

\*Consult factory for other connection sizes

## SIZING CORRECTION FACTORS

To find the maximum flow at pressures other than 100 psig [7 kgf/cm<sup>2</sup>], multiply the flow (from table above) by the Correction Factor corresponding to the minimum pressure at the inlet of the filter. Do not select filters by pipe size; use flow rate and operating pressure.

psig	20	30	40	60	80	100	125	150	175	200	250	300
kgf/cm <sup>2</sup>	1.4	2.1	2.8	4.2	5.6	7.0	8.8	10.6	12.3	14.1	17.6	21.1
Correction Factor	0.30	0.39	0.48	0.65	0.82	1	1.22	1.43	1.65	1.87	2.31	2.74



[www.championpneumatic.com](http://www.championpneumatic.com)

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Due to Champion's continuing product development program, specifications and materials are subject to change without notice or obligation.

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