

EMS-CF-F5-20

Pleated depth filter cartridge, 5 µm nominal protection rating, 20 in

First fine stage for a secondary loop, sized behind a bulk element

A polypropylene pleated depth cartridge rated 5 µm nominal, 20 in (508 mm) long with a 2.70 in (68.6 mm) outside diameter. Nominal-rated media is published at 90% removal efficiency, the element changes out at 35 psid (2.4 bar), and the maximum differential pressure is 60 psid (4.1 bar) at 20 °C. A 5 µm element blinds quickly on bulk debris, so it is specified downstream of a 1–10 µm bulk stage rather than on its own.

ORDERING INFORMATION

Part number	EMS-CF-F5-20
Micron rating	5 µm (protection rating, nominal basis)
Nominal length	20 in (508 mm)
Outside diameter	2.70 in (68.6 mm)
Media	PP pleated depth
Change-out ΔP	35 psid (2.4 bar)
Maximum temperature	80 °C (176 °F)
Seal options	NBR, EPDM, silicone, FKM, PTFE-encapsulated

FILTRATION RATING AND RETENTION BASIS

Parameter	Value	Notes
Micron rating (protection rating)	5 µm	Protection rating: the rating the operating element holds to protect the cold plate. Not a commissioning staging step and not an inlet strainer rating
Retention basis	Nominal, published at 90%	Nominal-rated media is published at 90% removal efficiency; absolute-rated media is published up to 99.98%
Removal efficiency at the rated size	90%	Nominal basis, valid for the stated particle size only
Beta ratio basis	$\beta x(c) = \frac{\text{upstream particles}}{\text{downstream particles at size } x}$	Efficiency = $(\beta - 1) \div \beta$
Beta ratio bands published for this category	Poor elements β 2–10; expert-recommended minimum $\beta \geq 75$; top of the published range β 200–2000	Ask for the beta figure at the size you care about rather than a headline efficiency
Beta reference point	$\beta 3$ above 200 corresponds to 99.5% efficiency at 3 µm	Published worked reference; the 3 µm figure is the beta test particle size, not a protection rating, a commissioning staging step or an inlet strainer rating. Beta is valid only at the stated size and only for a new element
Beta test method	ISO 16889 multi-pass	Standard designation published as the method the rating is built to
Protection-rating selection rule	Absolute rating 7–10× smaller than the finest cold-plate channel	Cold-plate microchannels run about 100–300 µm; direct-liquid-cooling microchannels are quoted as narrow as 100–400 µm

Parameter	Value	Notes
Channel blockage rule	A hard particle over half the channel width raises blockage probability	At channel entrances and bends
Suspended solids target served	Below 5 µm at the cold plate; below 10 µm at a rear-door heat exchanger	Protection-rating targets; this rating sits on the cold-plate target and the same element also prefilters finer grades
Commissioning staging, a separate category	100 → 50 → 25 µm flush sequence	A commissioning procedure, not a product rating; it is not the rating of this element
Inlet strainer rating, a separate category	500 µm class at a unit inlet	Protects the pump and is not a filtration stage

ELEMENT CONSTRUCTION

Parameter	Value	Notes
Nominal length	20 in (508 mm)	Element length in the published 10–40 in (254–1016 mm) family
Nominal outside diameter	2.70 in (68.6 mm)	Published envelope for this element family
Media	PP pleated depth	Media, support, end caps, core and cage all polypropylene
Alternative media	Polypropylene, glass fibre, pleated polyester, stainless steel mesh, PES membrane, resin-bonded	Selected by duty; confirm at order
End caps	All-polypropylene	End-cap style nomenclature (DOE, SOE, 222, 226, fin, bayonet) is present in the trade but not verified from a readable specification page, so no style code is published here
O-ring and gasket options	NBR (Buna), EPDM, silicone, FKM (Viton), PTFE-encapsulated Viton, PTFE-encapsulated silicone	Specify the seal from the fluid: the published design basis is 25% v/v propylene glycol (PG25) with Hybrid-OAT inhibitors
Housing material	Glass-filled polypropylene	The housing follows the element
Stainless-steel insert	Required for hot-water and steam sanitisation	Not required for normal coolant service

DIFFERENTIAL PRESSURE, TEMPERATURE AND SANITISATION

Parameter	Value	Notes
Clean differential pressure	0.17 bar (2 psid)	Published on a clean 2 µm element; the 5 µm grade sits close to this figure
Recommended change-out ΔP	35 psid (2.4 bar)	The primary element-change trigger
Maximum differential pressure	60 psid (4.1 bar)	At 20 °C (68 °F); past this the element is outside its published differential limit
Maximum temperature	80 °C (176 °F)	Service limit for the element
Hot-water sanitisation	80 °C for 30 min	Stainless-steel insert required
Steam sterilisation	121 °C for 30 min, multiple cycles	Stainless-steel insert required
Headroom, clean to change-out	About 17×	Derived from the two published figures
Headroom, clean to maximum	About 30×	Derived from the two published figures
Service consequence past change-out	Falling flow, falling local heat rejection, rising core temperature	At microchannel scale a blocked channel removes local heat rejection entirely

FLOW, CAPACITY AND CLEANLINESS CLASSIFICATION

Parameter	Value	Notes
Flow range	Open — not published as a curve	The source research publishes no flow-versus- ΔP curve for this element; the published pressure anchors are 0.17 bar (2 psid) clean and 35 psid (2.4 bar) change-out
Resulting pressure drop at the rated flow	Open — confirmed at order	Pressure drop follows the housing and the flow; no per-model curve is published
Dirt-holding capacity	Open — not published	Not verified from a readable source; confirmed against the supplier document at order
Prefiltration requirement	Specify a 1–10 μm bulk stage upstream	The 1–10 μm figure is the protection rating of the upstream bulk stage; a 5 μm element clogs quickly on bulk debris and an unfiltered first fill blinds it
Downstream stage	Membrane-grade polish, 0.45 μm and finer	Membrane-grade protection ratings; stages 1, 2 and 5 of the published five-stage placement model are supplied, and stage 4 sits inside a CDU and belongs to the CDU maker
Fluid cleanliness classification	ISO 4406	Classification framework developed for hydraulic fluids and applied to coolant loops; no counting volume is published here
Component cleanliness standards	ISO 16232 and VDA 19.1	Flush extraction onto a filter membrane for automatic optical analysis
Change-out record fields	ΔP at change; hours in service; ISO 4406 code trend; fluid appearance	Recorded at every element change

APPLICATIONS

- First fine stage on a secondary loop behind a bag or coarse element
- Cold-plate protection where the published suspended-solids target is below 5 μm
- Prefiltration ahead of a 1 μm or membrane-grade element
- Rear-door heat-exchanger protection in a 20 in (508 mm) housing

COMPATIBLE PRODUCTS

- Glass-filled polypropylene housings for 20 in (508 mm) elements
- EMS-CF-F10-20 as the bulk stage upstream
- EMS-CF-FP-DP element differential-pressure monitor
- EMS-CF-FP-K filter performance monitoring installation kit

CARTRIDGE LADDER AT 20 IN (508 MM)

Parameter	Value	Notes
EMS-CF-F10-20	10 μm, nominal	Bulk particulate stage
EMS-CF-F5-20	5 μm, nominal	First fine stage
EMS-CF-F1-20	1 μm, absolute option	Fine polish
EMS-CF-F0.45-20	0.45 μm, absolute	Membrane-grade polish

FULL CARTRIDGE LADDER

Parameter	Value	Notes
EMS-CF-F100-10	100 µm, nominal	10 in (254 mm)
EMS-CF-F10-20	10 µm, nominal	20 in (508 mm)
EMS-CF-F5-10	5 µm, nominal	10 in (254 mm)
EMS-CF-F5-20	5 µm, nominal	20 in (508 mm)
EMS-CF-F5-40	5 µm, nominal	40 in (1016 mm)
EMS-CF-F1-10	1 µm, absolute option	10 in (254 mm)
EMS-CF-F1-20	1 µm, absolute option	20 in (508 mm)
EMS-CF-F1-40	1 µm, absolute option	40 in (1016 mm)
EMS-CF-F0.45-20	0.45 µm, absolute	20 in (508 mm)
EMS-CF-F0.45-40	0.45 µm, absolute	40 in (1016 mm)
EMS-CF-F0.2-40	0.2 µm, absolute	40 in (1016 mm)
EMS-CF-F0.1-40	0.1 µm, absolute	40 in (1016 mm)
EMS-CF-F0.05-40	0.05 µm, absolute	40 in (1016 mm)

NOTES

- The code rule is published: the micron value is written as published, so 0.45 µm appears as 0.45 and 0.05 µm as 0.05, and the trailing number is the length in inches.
- Every micron figure on this datasheet is labelled by category. 5 µm is this element's protection rating. The 100 → 50 → 25 µm flush sequence is commissioning staging, a procedure rather than a product rating, and the 500 µm class at a unit inlet is a strainer rating.
- A 5 µm element clogs quickly on bulk debris; the bulk stage upstream of it is part of the specification, not an option.
- Dirt-holding capacity in grams and end-cap style nomenclature are not published in the source research; both rows stay open and are confirmed against the supplier document at order.

Full specification sheet and current pricing
 EMS-Trade Cooling · ems-cool.com
 Typical lead time confirmed on order acknowledgement.

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