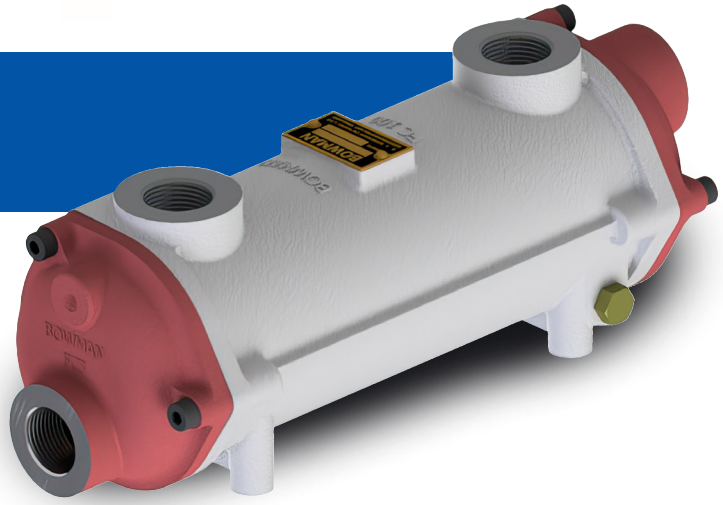
PRODUCT PROFILE

FC Series
Hydraulic Oil Coolers



Introduction

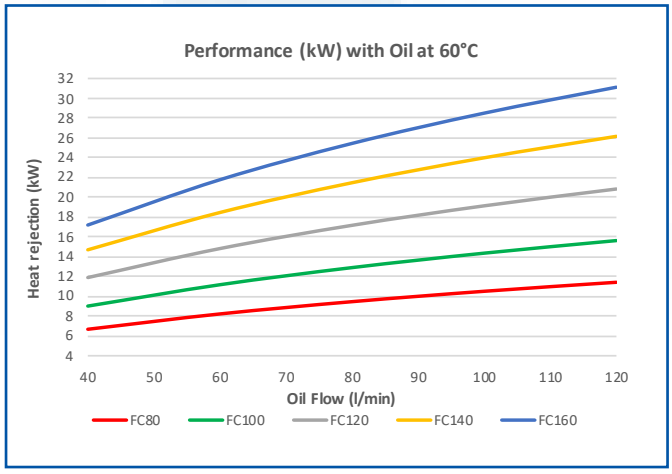
Bowman hydraulic oil coolers offer efficient, reliable heat transfer performance for a wide range of cooling requirements. Suitable for cooling a variety of oils, using either fresh or sea water, they have become the unit of choice for hydraulic engineers the world over.

Typical Performance

Bowman FC oil coolers can remove from around 7kW up to 52kW of heat and the tables and graphs below show examples of their cooling performance throughout the range, using different water flow rates and oil temperatures.

The figures show typical heat transfer performance and any changes in temperature, flow rate or fluids will significantly alter their performance, so whilst this information is provided for guidance, specific application details should be sent to Bowman, or an authorised distributor, to ensure the correct unit is specified.

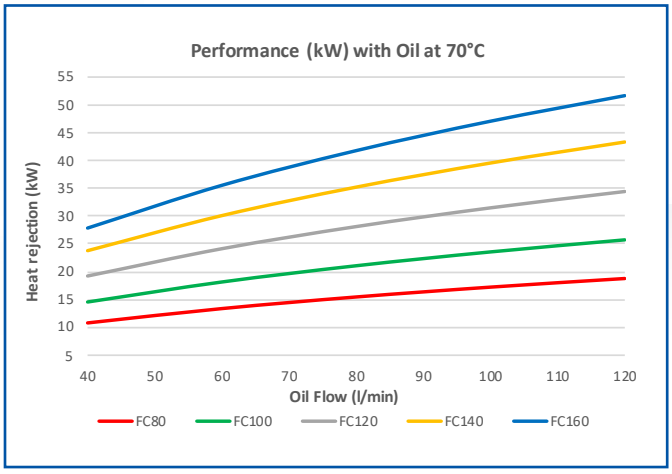
ISO 46 Oil at 60°C on inlet to the cooler
Water inlet temperature: 30°C at 60 l/min



	Heat Dissipation (kW) vs Oil Flow Rate (l/min)				
Model	40 l/min	60 l/min	80 l/min	100 l/min	120 l/min
FC80	6.7	8.2	9.5	10.5	11.4
FC100	9.0	11.2	12.9	14.4	15.6
FC120	11.9	14.8	17.2	19.1	20.8
FC140	14.7	18.5	21.5	24.0	26.2
FC160	17.2	21.8	25.4	28.5	31.1

	Oil Outlet Temp (°C) vs Oil Flow Rate (l/min)				
Model	40 l/min	60 l/min	80 l/min	100 l/min	120 l/min
FC80	54.2	55.3	55.9	56.4	56.7
FC100	52.2	53.5	54.4	55.0	55.5
FC120	49.6	51.4	52.5	53.4	54.0
FC140	47.2	49.3	50.7	51.7	52.4
FC160	45.0	47.3	48.9	50.1	51.0

ISO 46 Oil at 70°C on inlet to the cooler
Water inlet temperature: 25°C at 80 l/min



	Heat Dissipation (kW) vs Oil Flow Rate (l/min)				
Model	40 l/min	60 l/min	80 l/min	100 l/min	120 l/min
FC80	10.8	13.4	15.5	17.2	18.8
FC100	14.6	18.2	21.1	23.6	25.7
FC120	19.2	24.1	28.1	31.5	34.4
FC140	23.8	30.1	35.2	39.6	43.3
FC160	27.8	35.5	41.8	47.1	51.7

	Oil Outlet Temp (°C) vs Oil Flow Rate (l/min)				
Model	40 l/min	60 l/min	80 l/min	100 l/min	120 l/min
FC80	60.7	62.3	63.4	64.1	64.6
FC100	57.4	59.6	60.9	61.9	62.6
FC120	53.3	56.1	57.9	59.1	60.1
FC140	49.3	52.6	54.8	56.3	57.5
FC160	45.7	49.4	51.9	53.7	55.1

Computer Selection Programme

Given specific details including oil type and flow rate, temperatures of oil and water and heat dissipation required we can use computer aided selection software to accurately select the ideal unit for your application. Please contact our technical sales team or your local Bowman distributor for assistance.

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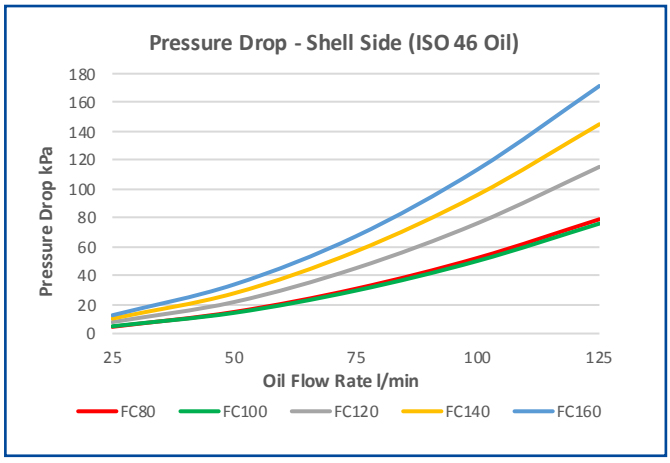
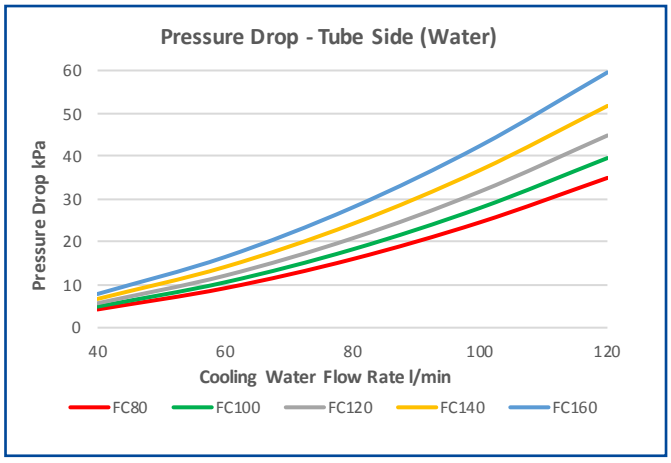
Pressure Drop

The graphs show the typical pressure drop that is expected when using a normal flow, three pass, FC series oil cooler. Where flow rates or pressure drops are too high, we may be able to offer alternative configurations such as high flow, single pass or two pass models which can accept higher flow rates with reduced pressure drop. Alternatively, a different size cooler can be selected. If detailed pressure drop information for specific flows, fluids or temperatures is required, please contact a distributor or our technical sales team.

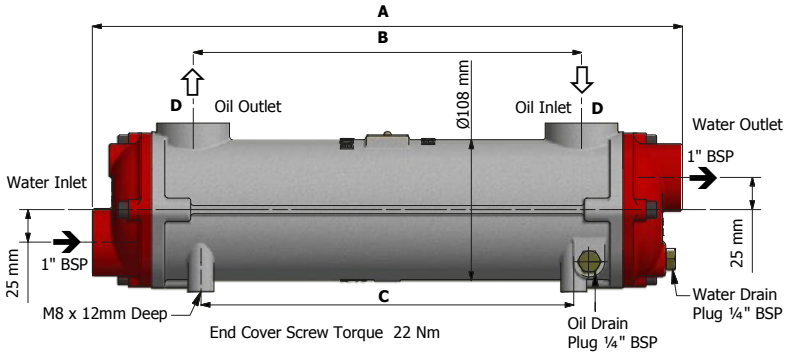




	Pressure Drop (kPa) - Shell Side (ISO 46 Oil)				
Model	25 l/min	50 l/min	75 l/min	100 l/min	125 l/min
FC80	4.7	15.0	31.0	52.4	79.2
FC100	5.1	14.3	29.8	50.3	76.2
FC120	8.0	21.9	45.3	76.5	115.5
FC140	10.4	27.9	56.9	96.1	145.0
FC160	12.7	34.0	67.4	113.7	171.5

	Pressure Drop (kPa) - Tube Side (Water)				
Model	40 l/min	60 l/min	80 l/min	100 l/min	120 l/min
FC80	4.3	9.2	16.0	24.6	34.9
FC100	4.9	10.6	18.3	27.9	39.6
FC120	5.7	12.2	20.9	31.8	44.8
FC140	6.7	14.2	24.2	36.7	51.7
FC160	7.9	16.5	28.0	42.4	59.6

Specification / Materials



Body Diameter 108 mm

	Standard	Marine	Other options
Tube	90/10 Cupro Nickel	90/10 Cupro Nickel	Copper, 70/30 Cupro Nickel, Titanium
Shell	Aluminium	Aluminium	Cast Iron (some models)
End Covers	Cast Iron	Composite or Brass / Bronze	2 pass and single pass in cast iron and brass / bronze
Seals	Nitrile	Nitrile	Viton, EPDM

Model	Max Flow	Number of Tubes	Surface Area	Volume(litres)		Weight	A	B	C	D	D*
	Shell side		(m^2)	Shell	Tube	kg	mm	mm	mm	BSP	BSP
FC80	140	91	0.32	0.75	0.65	5.5	272	116	104	1"	N/A
FC100	145	91	0.47	1.1	0.84	6.3	358	202	190	1"	1¼"
FC120	116	91	0.64	1.5	1.06	7.3	456	300	288	1"	1¼"
FC140	105	91	0.87	2	1.35	9.4	584	428	288	1"	1¼"
FC160	96	91	1.12	2.6	1.68	11	730	574	434	1"	1¼"

Please note: dimensions marked D* are for high flow versions only. FC80 models are not available in high flow versions.

Flow rates – Tube Side

Flow rate is important to the performance of the oil cooler but it is also crucial that minimum and maximum flow rates are adhered to in order to ensure longevity of the unit in service. Please refer to the following table for minimum and maximum flow rates.

	Minimum Flow Rate (l/min) Based on 1m/s Velocity			Maximum Flow Rate (l/min) Sea Water - Based on 2m/s Velocity			Maximum Flow Rate (l/min) Fresh Water - Based on 3m/s Velocity		
Model	1 Pass	2 Pass	3 Pass	1 Pass	2 Pass	3 Pass	1 Pass	2 Pass	3 Pass
FC Series	115	60	40	230	120	80	380	200	135

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