

PRODUCT PROFILE

FG Series

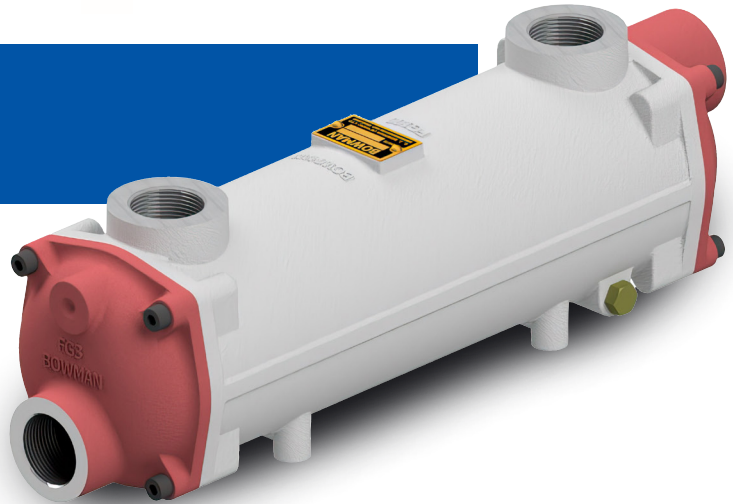
Hydraulic Oil Coolers

Introduction

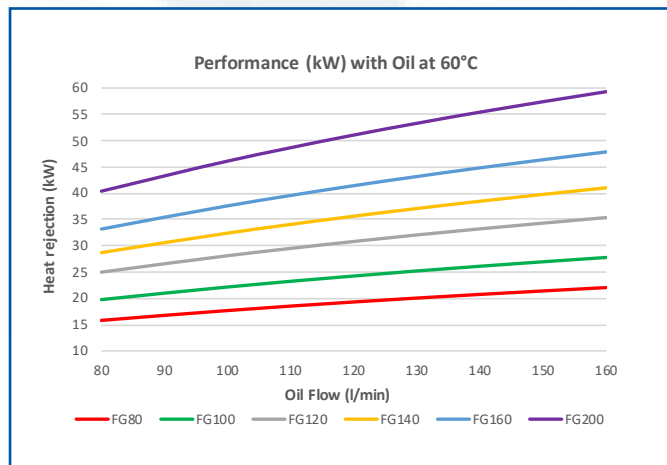
Bowman hydraulic oil coolers offer efficient, reliable heat transfer performance for a wide range of cooling requirements. Suitable for cooling a variety of oils, using either fresh or sea water, they have become the unit of choice for hydraulic engineers the world over.

Typical Performance

Bowman FG oil coolers can remove from around 16kW up to 100kW 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.



ISO 46 Oil at 60°C on inlet to the cooler
Water inlet temperature: 30°C at 80 l/min

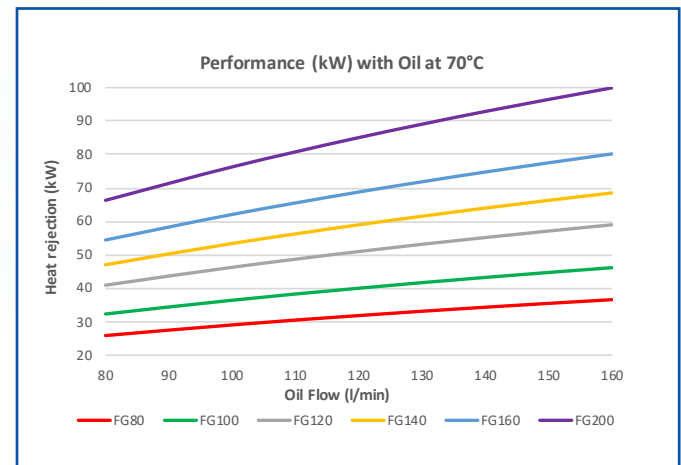


Heat Dissipation (kW) vs Oil Flow Rate (l/min)						
Model	80 l/min	100 l/min	120 l/min	140 l/min	160 l/min	
FG80	15.8	17.7	19.3	20.7	22.0	
FG100	19.8	22.2	24.2	26.1	27.8	
FG120	25.0	28.1	30.8	33.2	35.4	
FG140	28.7	32.4	35.6	38.5	41.0	
FG160	33.2	37.6	41.4	44.8	47.9	
FG200	40.4	46.1	51.1	55.4	59.3	

Oil Outlet Temp (°C) vs Oil Flow Rate (l/min)						
Model	80 l/min	100 l/min	120 l/min	140 l/min	160 l/min	
FG80	53.1	53.9	54.4	54.9	55.2	
FG100	51.4	52.3	53.0	53.5	54.0	
FG120	49.1	50.2	51.1	51.8	52.3	
FG140	47.5	48.7	49.7	50.4	51.1	
FG160	45.5	46.9	48.0	48.8	49.6	
FG200	42.3	43.9	45.1	46.2	47.1	

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 70°C on inlet to the cooler
Water inlet temperature: 25°C at 110 l/min



Heat Dissipation (kW) vs Oil Flow Rate (l/min)						
Model	80 l/min	100 l/min	120 l/min	140 l/min	160 l/min	
FG80	25.9	29.0	31.8	34.3	36.6	
FG100	32.3	36.4	40.0	43.2	46.2	
FG120	40.9	46.3	51.0	55.2	59.0	
FG140	47.0	53.4	59.0	64.0	68.5	
FG160	54.4	62.1	68.8	74.8	80.2	
FG200	66.3	76.3	85.1	92.9	99.9	

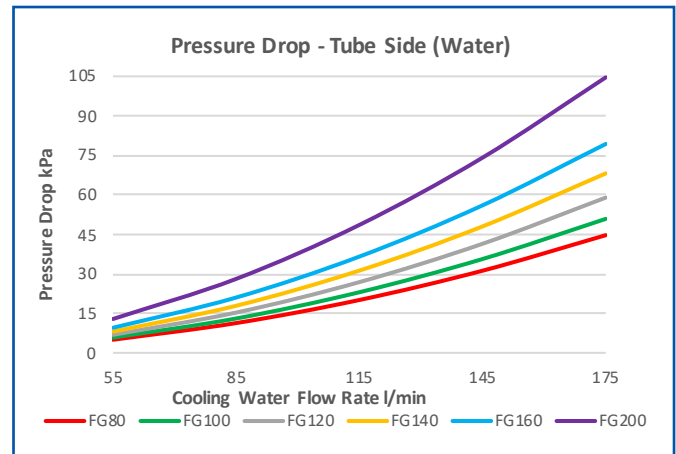
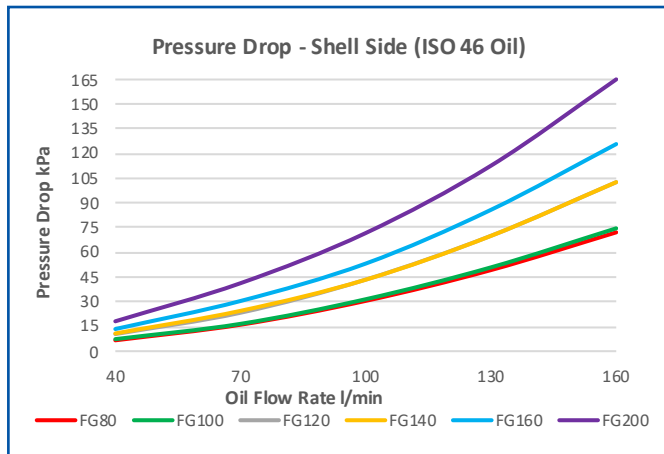
Oil Outlet Temp (°C) vs Oil Flow Rate (l/min)						
Model	80 l/min	100 l/min	120 l/min	140 l/min	160 l/min	
FG80	58.9	60.0	60.9	61.6	62.1	
FG100	56.0	57.4	58.5	59.4	60.1	
FG120	52.3	54.0	55.3	56.4	57.3	
FG140	49.6	51.5	53.0	54.2	55.2	
FG160	46.3	48.4	50.1	51.5	52.6	
FG200	40.9	43.3	45.2	46.9	48.2	

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.

Pressure Drop

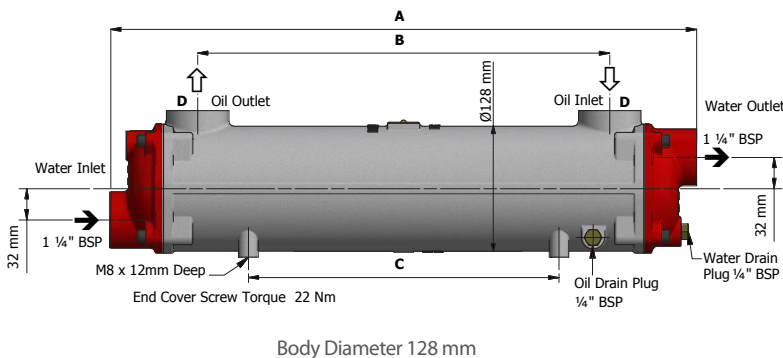
The graphs show the typical pressure drop that is expected when using a normal flow, three pass, FG series oil cooler. Where flow rates or pressure drops are too high, we may be able to offer alternative configurations such as high flow, single pass or two pass models which can accept higher flow rates 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	40 l/min	70 l/min	100 l/min	130 l/min	160 l/min
FG80	6.6	16.1	30.6	49.3	72.2
FG100	7.4	16.6	31.6	50.9	74.6
FG120	10.4	23.4	43.5	70.1	102.7
FG140	10.8	24.5	43.5	70.1	102.7
FG160	13.5	30.5	53.3	85.9	125.8
FG200	18.2	41.4	71.8	112.7	165.1

Pressure Drop (kPa) - Tube Side (Water)					
Model	55 l/min	85 l/min	115 l/min	145 l/min	175 l/min
FG80	5.0	11.3	20.1	31.2	44.7
FG100	5.8	13.1	23.0	35.7	50.9
FG120	6.9	15.3	26.9	41.4	59.0
FG140	8.1	17.9	31.3	48.0	68.2
FG160	9.6	21.0	36.6	56.0	79.3
FG200	12.9	28.1	48.6	74.2	104.6

Specification / Materials



	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 (m ²)	Volume(litres)		Weight	A	B	C	D	D*
	Shell side			Shell	Tube	kg	mm	mm	mm	BSP	BSP
FG80	192	127	0.66	1.64	1.26	8.5	374	196	92	1 1/4"	1 1/2"
FG100	190	127	0.91	2.4	1.56	10	472	294	190	1 1/4"	1 1/2"
FG120	160	127	1.22	3	1.96	12	600	422	318	1 1/4"	1 1/2"
FG140	160	127	1.58	3.9	2.42	14.5	746	568	464	1 1/4"	1 1/2"
FG160	145	127	2.02	5	2.97	17.5	924	746	642	1 1/4"	1 1/2"

Please note: Dimensions marked D* are for high flow versions only.

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.

Model	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		
	1 Pass	2 Pass	3 Pass	1 Pass	2 Pass	3 Pass	1 Pass	2 Pass	3 Pass
FG Series	160	85	55	320	170	110	530	270	180

EJ Bowman (Birmingham) Ltd

Chester Street, Birmingham B6 4AP, UK

Tel: +44 (0) 121 359 5401 Fax: +44 (0) 121 359 7495

Email: sales@ej-bowman.com www.ej-bowman.com



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