

Service News



C.F.O. Heating

C.F.O. is the popular fuel type for Miura boiler. Then, Miura Service News, Vol.15 would like to explain the trouble shooting concerning C.F.O. heating.

1. C.F.O. Heating temperature

For normal combustion, the heavy oil is necessary to be heated up to the proper temperature. Moreover, the setting temperature of the oil heater also should be adjusted according to the viscosity of the heavy oil.

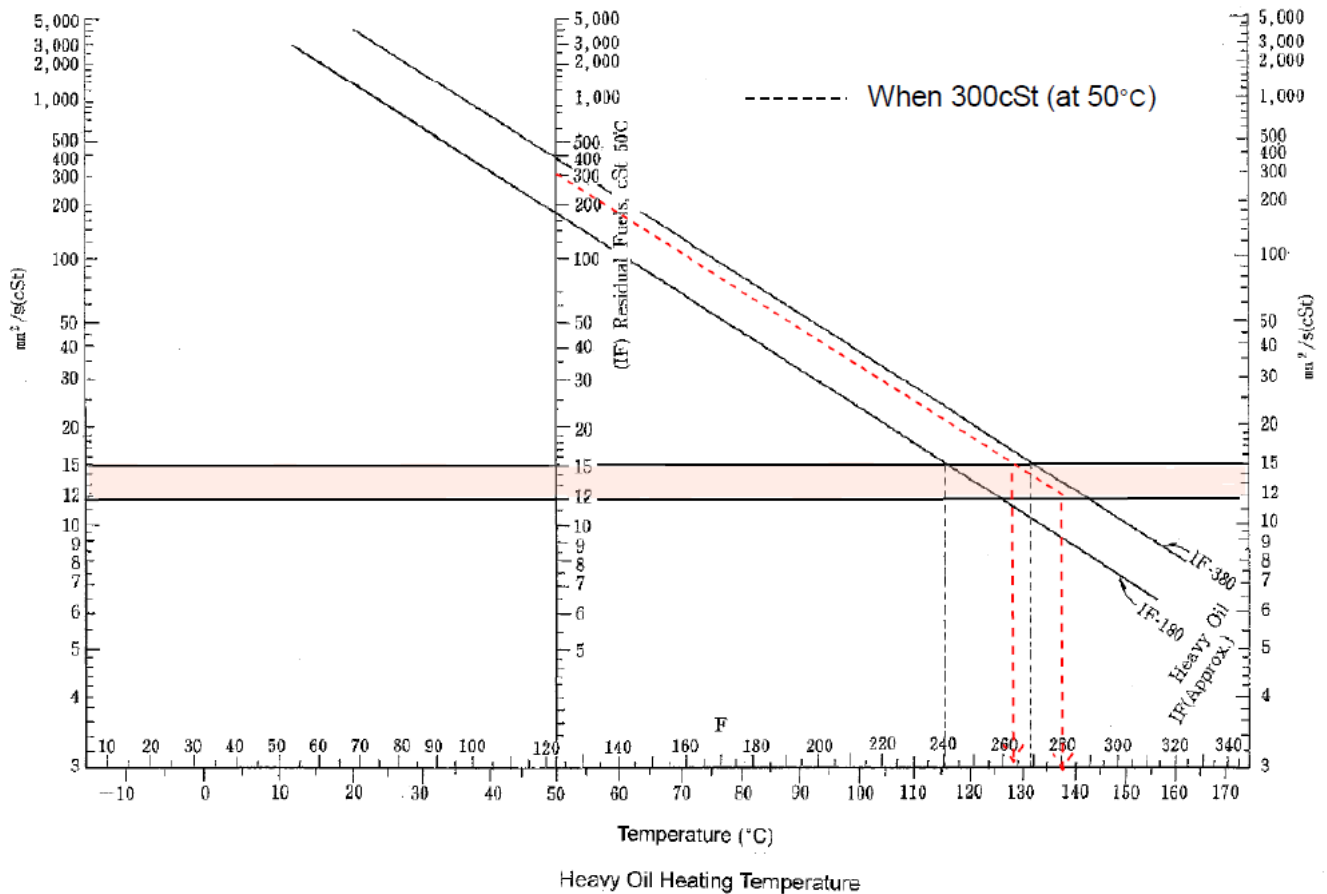
Standard table of
oil heater setting temperature
3500sec, 380cst: About 135-140°C
2500sec, 280cst: About 130°C
1500sec, 180cst: About 125°C

*Please see the below table enclosed in the operation manual.

Table 5-1 Temperature Setting toward Viscosity (Example)

Redwood No.1Sec./100°F	1500 sec.	2500 sec.	3500 sec.
Kinematic Viscosity (cSt) at 50°C (IF) Residual Fuels, cSt/50°C	IF-180 180 cSt	(280cSt)	IF-380 380 cSt
Kinematic Viscosity (cSt) at 100°C CIMAC and ISO Fuels, cSt/100°C	25 cSt CIMAC/RM-25	-	35 cSt CIMAC/RM-35
Fuel oil heating temperature (Setting temperature of temperature controller)	~125°C	130°C	135-140°C

Table 5-2 Heavy Oil Heating Temperature Chart



Moreover, oil heating in the service tank and piping insulation by steam trace and so on are required because Miura oil heater is designed based on the heavy oil temperature $65 \pm 5^\circ\text{C}$ on the oil pump inlet side.

aa) In case of high oil heater setting temperature (high heavy oil heating temperature)

Vapor occurs and fluctuation of oil pump discharge pressure is caused. The safety valve of oil heater blows out. The poor combustion is caused by oil pressure change. There are same cases that the oil pressure does not increase.

bb) In case of low oil heater setting temperature

The air atomizing from the burner cannot be carried out properly, and then the poor combustion occurs. It causes the unburned oil standing and unburned matters accumulation, smoke (black smoke), misfire and so on.

2. C.F.O. combustion trouble

< Case 1 Black smoke >

*The air atomizing is not carried out properly because the setting temperature of oil heater is low, and then vibration combustion has occurred. A lot of the burned oil adhered to the baffle plate and air register. Moreover, the soot adhesion inside the chamber, caused by continuous combustion under black smoke, and then Exh. gas high alarm has occurred.

⇒Set up the oil heater to the proper temperature after soot washing inside the chamber.

< Case 2 Oil pressure low and misfire >

*It seems that the oil heater setting temperature is proper, sometimes hunching and oil pressure change appears. C.F.O. was supplied from the settling tank without the cleaner, not from the service tank. Therefore, a lot of water is included and serious vapor was caused. Moreover, the sludge is accumulated in the each strainer.

⇒After cleaning the each strainer, let C.F.O. through a cleaner and supply from the service tank.

< Case 3 Exh. Gas High Temp. Alarm >

*A lot of soot and the unburned matters inside the chamber. A lot of water is included in C.F.O. because C.F.O. is supplied without cleaning as the cleaner has troubles. The oil heater setting temperature goes down until around 100 °C because the vapor is caused if the heating temperature is increased to the proper temperature. The combustion is carried out with difficulty, but atomizing inferior is caused. Moreover, the setting is low because the oil temperature low alarm is occurred.

⇒After repairing the cleaner and cleaning the soot in the chamber, set the oil heater to the proper temperature. Return the oil temperature low alarm to the beginning setting.

< Case 4 There are no any problems with M.D.O. combustion, but white smoke occurs at C.F.O. combustion. >

*In case of A.F.O., oil pressure does not change because the oil pump unit and the each tank are installed on the same deck. In case of C.F.O., oil pressure changes because C.F.O. service tank and oil pump unit are on the same deck, moreover, the piping is long and pressure loss is high. Especially, this is caused when the volume of C.F.O. in the tank decreases. The oil pressure changes, and oil pump inlet is negative pressure. So, atomizing is not stable and it the bad combustion is caused.

⇒The booster pump is installed in the piping. (We assume that this case also can be improved by lowering the position of the oil pump unit than the position of the service tank.)

< Case 5 Flame remains after combustion is completed, and the abnormal flame alarm occurs. >

*The atomizing is not normal because the oil heater setting temperature is low. There are not any smoke, but vibrating combustion (Flame Flickers) is caused. Therefore, the unburned oil and etc. drop in the bottom of the chamber, and the matter such as a carbon egg is formed. After combustion stop, the flame and formed matter has red heating.

⇒After cleaning the bottom of the chamber, set the oil heater to the proper temperature.

Please adjust the oil heater setting temperature according to the combustion and smoke condition after setting the standard by the table of heavy oil heating temperature. However, water and volatile matter included in C.F.O. must be removed with the cleaner and etc. If they are not removed and supplied, the heating cannot go up to the proper temperature, and the bad combustion may be caused.

Please do not continue the combustion by going down the oil temperature low alarm setting because the fluctuation prevents heating until the proper temperature. There is danger of the serious accident by quickening the bad combustion and unburned matter and oil. Please get red of the causes in advance.

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<https://www.miuraz.co.jp/en/marine/service/network.html>



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We hope to receive your continuous support in the future.