



# Service News



At this time, we would like to explain the soot fire.



## Soot Fire

### 【Soot Fire】

A minute particle component discharged from the diesel engine is generally called the soot, and adheres and accumulates on the heating tube inside the Exh. gas economizer. This soot catches fire spontaneously, or the sparks of fire which comes by air cause the fire, and then the heating tubes are damaged such as pin hole and welded. This is soot fire.

### 【Mechanism of Soot Fire】

#### 1. Soot Adhered

The soot accumulation is caused by the soot in the Exh. gas adheres on the heating tubes and grows up, and the soot which adheres on the upper fannel wall drops and accumulates partially.

#### 2. Soot Ignition

We assume that the cause of the accumulated soot ignition is the sparks of fire comes by air from the upper gas flow, or the surroundings temperature increasing by high temperature Exh. gas and then catches fire spontaneously.

Generally, the surface layer of the accumulated soot is exposed to the high temperature Exh. gas and the quiet oxidation reaction repeats. Therefore, a lot of ashes are included, the soot that has the high spark point is removed, and then it is difficult condition that the soot catches fire. However, the insufficient water cleaning removes the soot that has the high spark point, the lower accumulated soot that has the low spark point is exposed, and then it is easy that the soot catches fire. Moreover, because the oxygen concentration in Exh. gas generally decreases at the high load, it is high possible that the soot catches fire at low load. We assume that the adhered and accumulated soot ignites when those conditions work together.

### 3. Heating Tubes Damages

If the soot which adheres and accumulates on the Exh. gas economizer heating tube is burned, the heating load of the heating surface increases rapidly, but the temperature of the tube wall stops at the level which is a little difference with the inside fluid temperature because the heat exchange is carried out when the circulating water volume of the hearing tube is not sufficient.

However, if the heat exchange is not carried out sufficiently (if the heating tube is not cooled down sufficiently), the tube wall temperature increases rapidly and damages the heating tube such as pin hole and welded. At this time, the Exh gas economizer repair fee and working fee are required terribly, including the economical damage caused by the ships operation stops.

#### 【Cause of Soot Fire】

1. A large quantity of soot adhesion
2. The circulating pump is not operated sufficiently after M/E operation stop.  
(The circulating pump is not operated when M/E such as the shift operation time is short.)

#### 【Soot Fire Prevention】

1. To cool down the heating tube, operate the circulating pump for 6 hours and more after M/E operation stops. The operation time of the circulating pump (6 hours and more) is only for Miura's Exh. gas economizer. In case of the other maker's goods, be careful.
2. To prevent the soot from adhering and growing up, carry out the soot blower two or three times per a day. According to the fuel oil cleaning, the number of times of soot blower is to be added. Keep the high pressure source as much as possible to get the good results of soot blower.
3. Carry out the water cleaning sufficiently. In case of the insufficient water cleaning, the unburned soot is easy to be exposed and catch fire, sulfur of the residual soot reacts to water, and then may cause the sulfate corrosion.
4. For the soot fire prevention, the most effective measure is to prevent the soot as the source of catching fire from occurring. This is means optimum of M/E combustion. However, the soot cannot be prevented as considering the property of the current used fuel.

Therefore, it is important to remove the adhered soot under making good arrangements of dirt detection.

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



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