



Backpressure in exhaust smokestack

The trouble of the boiler and the incinerator in the combustion equipment may result from several factors. Causes may exist in normally observed portions, daily inspection portions or completely unforeseeable portions; therefore, there are many instances where trouble may occur. In this issue, clogging of the smokestack will be explained, which is a case with an occasional occurrence, is rarely spotted.

One case explained.

We were informed that flame failure occurred on a hot water boiler. When we asked for details concerning the flame failure by telephone, the crew informed us that since smoke from the smokestack had recently blackened, they thought that soot was clogged in the combustion furnace and then removed the soot. Immediately after cleaning, it seemed that the situation was temporarily recovered, however, it soon worsened to the previous condition, and led to a flame failure on that day. We then dispatched service engineer to the ship for inspection and repair. First, burning data was checked, and it was found that the furnace pressure in the combustion chamber far exceeded the data at the commissioning test. Therefore the soot adhesion status in the combustion chamber was checked. We found that soot adhesion was not as problematic as the value of the furnace pressure. Further, the backpressure in the smokestack was measured using a monometer. It was +4mmAq and as a result, which had to be normally 0 or lower than 0 mmAq during pre-purge which was higher than the reference value. Thus, it was suspected that there existed pressure loss in the smokestack of the boiler, and we inspected the inside of the smokestack then it was confirmed that soot was accumulated on the horizontal portion between the elbows. In the end, cleaning of the soot in the exhaust smokestack eliminated the trouble.



Exhaust gas generated due to combustion of the burner passes through the flue of the boiler, and is discharged to the atmospheric air from the funnel. A draft force in the fan and smokestack

discharges exhaust gas, however, when this draft force in the smokestack lowers, it influences the exhaust gas discharge and conducts soot accumulation. Thus, the above trouble may result. The smokestack and flue are located where daily inspection or maintenance control is rarely performed, therefore, there are some cases where it is difficult to find the cause if any trouble occurs.

In order to prevent trouble before it occurs, it is of course necessary to check the combustion daily, and it is important to recognize the numerical trends by measuring the furnace pressure in the combustion chamber and back pressure in the flue regularly or when docking. Moreover, we recommend you eyes check and washing in furnace and exhaust smokestack when docking. Especially, check the bending and horizontal parts carefully. The maintenance of furnace pressure is significant for not only hot water boiler, incinerator but also steam boiler, composite boiler and Exh. gas economizer.

<How to measure furnace pressure>

1. Prepare copper pipes (approximately ϕ 6) and a manometer or vinyl tubes.

2. Insert a copper pipe into each measuring hole, and install the manometer.

3. Read the differential pressure relative to the atmospheric pressure (internal pressure in the engine room).



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