



ABSORPTION HEAT PUMP

ENHANCED FLUE GAS CONDENSING HEAT RECOVERY

With a combination of an absorption heat pump and a flue gas condensing unit, the heat recovery is enhanced. When some running conditions are a limitation for a flue gas condensing unit, such as high heat receiving water temperature and low fuel moisture, performance are guaranteed by adding an absorption heat pump to the condensing unit. Absorption heat pumps are using heat as their primary energy source and not mechanical or electrical energy.



INTERNATIONAL CO-OPERATION

In 2015, Condens Heat Recovery Oy has signed cooperation with a worldwide supplier of absorption heat pump to provide innovative and performant energy-savings solutions. Shuangliang Eco-energy Systems Co., Ltd is one of the worldwide leaders for absorption heat pump and chiller supply.



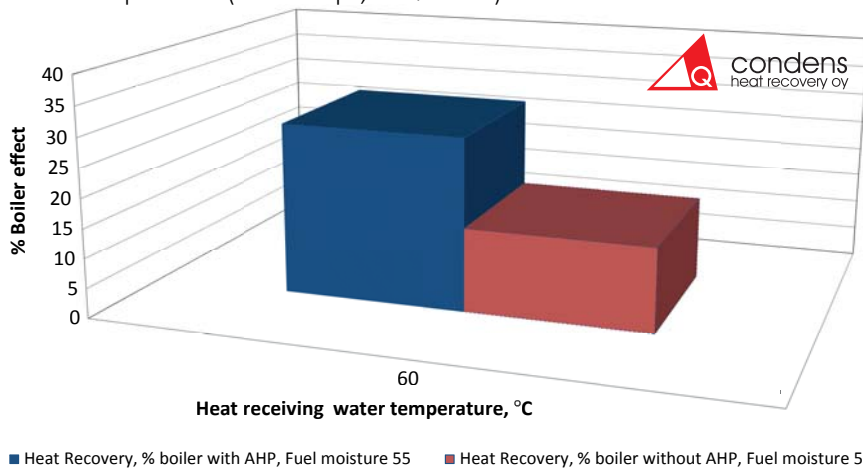
APPLICATIONS AND OPERATION

The benefit of connecting an absorption heat pump to a condensing unit varies depending on the running conditions. For some cases, heat recovery obtained with a combination of absorption heat pump and flue gas condensing unit can be twice as much as with a single flue gas condensing unit.

The charts below shows the heat recovery obtained in the case of a flue gas condensing unit installed after a woodchips boiler running at full load and with fuel moisture of 55%. The heat receiving water is at 60 °C.

The Impact of Absorption Heat Pump on a Flue Gas Condensing Unit

HEAT RECOVERY, % BOILER OUTPUT - Depending on heat receiving water temperature (Woodchips; 100% Load)

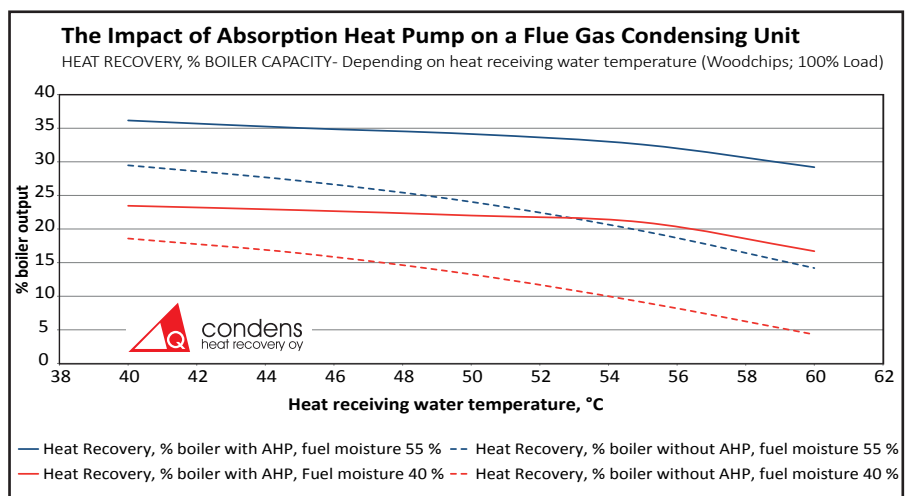


Absorption heat pumps can be used in a large variety of applications. The charts below describes the impact of connecting an absorption heat pump to a flue gas condensing unit on two main running parameters, which are the heat receiving water temperature and the fuel moisture.

HEAT RECEIVING WATER TEMPERATURE

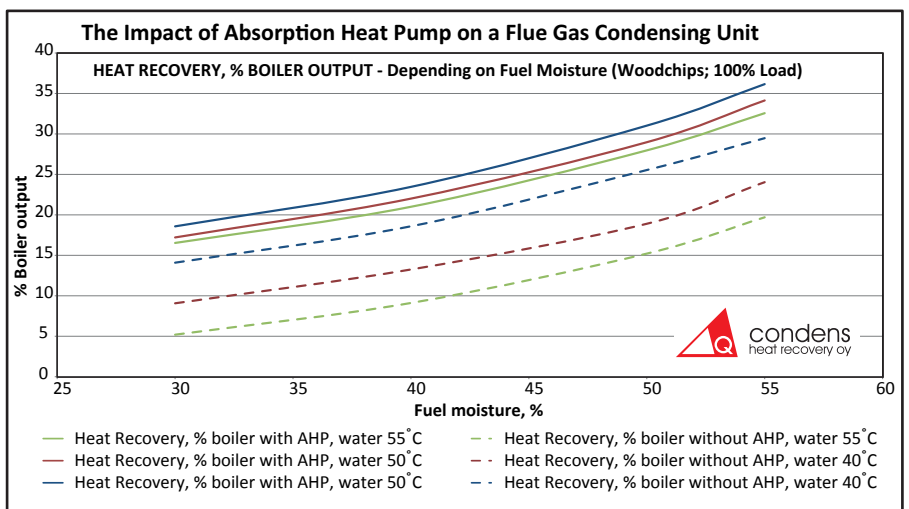
Here is a demonstration of the impact of a combination of absorption heat pump and flue gas condensing unit with different heat receiving water temperature.

The higher the heat receiving water temperature will be, the higher benefit will be gained by connecting an absorption heat pump to a flue gas condensing unit



FUEL MOISTURE

The total heat recovery is enhanced for all fuel moisture value and heat receiving water temperature, which allows a larger flexibility for the running operations.



The negative impact of high return temperature of heat receiving water for condensing heat recovery unit is eliminated with a combination of absorption heat pump and flue gas condensing unit.