



การประยุกต์ใช้ระบบหมอกน้ำเพื่อเพิ่มสมรรถนะของ เครื่องแลกเปลี่ยนความร้อนแบบระบายความร้อนด้วยอากาศใน
อุตสาหกรรมปิโตรเคมี

The performance of air-cooled heat exchangers in the condensate residue production of petrochemical plants

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Abstract

The performance of air-cooled heat exchangers in the condensate residue production of petrochemical plants had been reduced, resulting in not being able to reduce the temperature of the condensate residue as specified. Therefore, water mist systems had been applied to heat exchangers to help increase heat exchange performance. The hypothesis of the research was then the water mist system could reduce the inlet air temperature of the heat exchanger and make it able to handle more heating loads. The experiment to find the optimum conditions of the water mist system was conducted. There were factors of interest; 1) the water pressure of the water mist system 2) the air pressure of the water mist system, and 3) the amount of water mist nozzles. The results showed that the optimum condition was as follows: water pressure of the water mist system of 6 bars, air pressure of the water system of 2 bars and 16 spray nozzles. Then the inlet temperature of the air-cooled heat exchanger could be reduced in the range of 2.31 to 2.41 °C with a 95% confidence level and consequently, the heat exchange performance increased to 129.91 kW or 3.84%. When applying this condition in the production process model, the yield of the production process increased from 84 to 87 tons/hour, therefore, increased 3.45%.

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