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Abstract
Air-cooled condenser (ACC) is quite common in the heat transfer application, and the researches of local heat flow characteristic are also quite a lot. Most methods to improve hydrothermal effect are to increase the transfer area and reduce the pressure drop. The part I of the experiment will be used a digital particle image velocimetry (DPIV) system to measure instantaneous and non-invasive ensemble-averaged flow fields inside the glass curtain of the ACC. Particularly for the reduced scale test section of ACC that are used in incinerator, we are used to observe the streamline distributions at the middle plane inside the glass curtain in various inlet velocity of the blowers for the one-row, two-row, three-row ACC and the glass curtain with and without holes. In order to analyze deeply the flow field characteristic of atmospheric condenser, the part II of the experimental test section is designed to arrange 3-row staggered elliptic finned-tube which the major/minor axis ratios are 2.8. Four different kinds of hole-type of glass curtain are used to be the structure of the experimental model. And it is experimental apparatus to utilize a high particle image velocimetry (HPIV) system to control the change of flow field in a very minimum time. Also, it is discussed in detail that the flow field inside and outside the curtain is divided into four kinds of observation plane.
The experimental result shows that the structure of flow field of not hole the glass curtain forms the boundary layer separation on the surface of steam dust, and results in low-speed region field; In addition, because of the turbulent stagnate vortex flow, it has the chimney effect when approaching the outer wall curtain. The holes for ACC would be effective to reduce detained vortex and the shape parameter (hole-type) affects heavier than power parameter (inlet wind velocity). Among them, it is the most effective method to improve the back flow between the curtain outer wall and ACC. It can have better effect of thermal-hydraulic.
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