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Sponge-Ball Automatic Tube Cleaning Device for Saving Energy in a Chiller

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Abstract

The first sponge-ball automatic internal tube cleaning system, normally used for large heat exchangers in power plant applications, has been installed and tested in a seawater-cooled chiller in Hong Kong. The tests were thoroughly conducted under various weather conditions, cooling loads, and fouling conditions, in comparison with an identical chiller operating without a cleaning device. The low fouling factor maintained by the sponge-ball system is reflected by the small temperature difference between the condensing refrigerant and the water outlet, ranging from 2°C and 4°C depending on the cooling load. Without a sponge-ball system, the temperature difference is typically between 5°C and 11°C. The sponge-ball system improves the overall coefficient of performance (COP) by 12%. An economic analysis shows that the payback periods is within 3 years.

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