Parker Hannifin

Designing quieter heat exchangers

Parker Hannifin carefully selected the characteristics of the components of its new range of motor-driven air-oil heat exchangers. The acoustic tests showed a low noise level and confirmed that the cooling efficiency of the heat exchangers had been preserved.

OUR CUSTOMER

Corporate name
Parker Hannifin

Turnover
13.70 billion dollars in 2020

Workforce
Approximately 55,000 people in 50 countries

Business activity
World leading specialist in the development, production and marketing of components, systems and solutions for various sectors: hydraulics, pneumatics, electromechanics, filtration, instrumentation, connector technology, materials and aerospace.

Many construction and agricultural machines as well as many different types of industrial machines and equipment include hydraulic systems. These systems are equipped with a heat exchanger to control the oil temperature and prevent any overheating likely adversely affect their operation. No need to say that the overall performance of the hydraulic cooler is essential. However, in certain applications, this performance should not be reached to the detriment of certain noise level requirements. A heat exchanger is, by nature, a source of noise, as its function is to convey the fluid inside a matrix cooled by the air flow generated by a motor-driven fan. Parker Hannifin tackled this problem and developed, in collaboration with Cetim, a range of extremely quiet heat exchangers which nevertheless produce the expected cooling performance. "*Cetim has broad experience in acoustics and has suitable testing equipment. Its engineers helped us to determine the characteristics of the most important components of the heat exchangers with regard to noise*", explains René Bibang, R&D engineer at Parker Hannifin.

Tests to validate the choices

On the basis of these recommendations, Parker Hannifin chose the best possible combination of important components (type of fan, quantity and shape of the fan blades, air flow, characteristics of the matrix, etc.) to reach its noise level objective. Then, in order to confirm that the calculated design of the mechanical components gave the expected results, Cetim carried out acoustic tests in accordance with standard ISO 3744, with ten microphones. "*The tests confirmed that the new design of our heat exchangers met our expectations in terms of performance and noise, and the acoustic power level dropped by 2 to 3 dBA on average*", concluded René Bibang.

Cetim's asset

With its expertise in acoustics and in many branches of physics, Cetim can determine the relationship between the noise emitted by an item of equipment and the source phenomena such as shocks, friction, air flows, etc. Further to testing in accordance with the relevant procedures and analysis of the measured values, Cetim can then issue recommendations to reduce the noise.

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