Vincent Renault et al., Res. Rev. J Mat. Sci. 2017, 5:7
DOI: 10.4172/2321-6212-C1-011

Accelerated corrosion test for exhaust gas recirculation exchangers

Vincent Renault[1], **Anne-Gaëlle Villemiane**[1] and **Shayma El-Hafa**[2]
[1]Valeo THS, France
[2]MCA Ingénierie, France

The VALEO strategy focuses on two areas. First is to develop innovative technologies related to the reduction of CO_2 emissions and intuitive driving. The second is the geographical expansion in high growth regions. In the field of new heat exchanger integration within the EGR LP loops such as the Charge Air Cooler (CAC), it appeared that the condensation of aggressive chemical solution can occur. This condensation can lead to part material corrosion and that may create some issues in the field (leak, loss of thermal performance…). Different studies have already been carried out in order to develop specific tests for corrosion resistance evaluation. Most of these tests concern only small samples tested by immersion. The final product in its vehicle architecture could not be tested. The project was to develop and adapt a new Charge Air Cooler heat exchangers test bench for corrosion resistance evaluation of. A patent has been submitted on this specific test bench (n° FR3012217 A1). Thanks to the capabilities of the test benches, we reduced test duration considerably compared with other test methodologies such as immersion tests. Specific gas flow rate, condensate chemical flow rate injection and temperature were adapted to reach dew points leading to condensation of chemical mixtures inside the CAC. The repeatability of the corrosion test results was investigated. Condensate mixtures can be very aggressive for CAC corrosion resistance. Test bench conception in stainless steel and PTFE allow us to use very low or very high pH. That is necessary to adapt the condensate mixture with the real condensates extracted during engine tests by OEM. We compared the corrosion test results obtained on the CAC following the corrosion tests with parts from the vehicle. Then, test duration and the vehicle mileage were correlated in order to draw a reliability curve.

Biography

Vincent Renault is 29 years old and has been working for VALEO since 2007. He is specialized in materials and corrosion test bench development. He is metallurgical department manager for VALEO Thermal Systems materials laboratory.

vincent2.renault@valeo.com

Notes: