CONTINUOUS IN-CAR MONITORING OF COOLANT QUALITY

THE CHALLENGE

As the quality of the coolant cannot be monitored constantly during use, coolant replacement is based on fixed service intervals rather than its actual state.

Aged coolant needs to be exchanged as soon as possible as it leads to engine/battery failures.

Usually, coolant is exchanged earlier rather than later to ensure that damage is prevented, this however results in coolant waste and avoidable service costs.

THE CURRENT APPROACH

Coolants are exchanged on a regular basis, e.g. every 4 years/60,000 km, although most coolants could be used much longer.

Coolant quality could be checked by external laboratories, but due to significant expenditure of time and cost those tests are never performed.

ASTOUNDING REAL LIFE DATA

60,000 t of toxic coolant must be disposed every year in Germany1.

Coolant exchange amounts up to > € 1B yearly service costs in Germany2.

50% of engine failures are connected to coolant issues e.g. lacking quality of the coolant3.

The market volume for predictive maintenance for engine performance is expected to expand tenfold and hit US$ 1.3 billion until 20274.

THE BETTER WAY

Material sensors can be used to qualify the coolant continuously over its lifetime.

When necessary, indicators in the car display the need for a coolant replacement.

Additionally, material sensors can detect the type of coolant and indicate erroneous fillings.

THE BENEFITS

Continuous monitoring of coolant quality

Identification of the coolant type to detect erroneous fillings

Compatible with novel coolant solutions for e-vehicles

Optimal utilization/exploitation of coolant lifetime

Valuation of high-performance coolants due to reduced service intervals and connected service costs

Reduced coolant waste

Add-on: Coolant analysis can reveal potential security issues with the engine on the basis of abrasive residues in the coolant (predictive maintenance).

SENORICS IN A NUTSHELL

Robust, small, mobile

Broad spectral coverage

Low cost & powerful

USE CASE SUMMARY

AUTOMOTIVE

Senorics’ innovative spectrometer-on-chip sensor solution enables:

a miniaturized material sensor to be seamlessly integrated in any automobile environment for continuous measurements

a robust all-in-one spectroscopic sensor device suited for harsh environments

qualification and quantification of coolant composition for quality monitoring

Low device cost and mass-market readiness

Sources:

1 Holger Püchert, Ein Ansatz zur strategischen Planung von Kreislaufwirtschaftssystemen

2 Own calculation, based on market research

3 https://www.machinerylubrication.com/Read/29977/preventing-engine-failure

4 https://www.transparencymarketresearch.com/automotive-predictive-maintenance-market.html

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