INNOVATIVE FILTRATION & SEPARATION SOLUTIONS FOR ELECTRIFIED POWERTRAINS

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Electric vehicles without a combustion engine do not require the traditional set of engine-related filter products, e.g. engine air filter, oil filter, or fuel filter. In-depth analysis of the needs for robust and reliable operation of these vehicles reveals the need for new, innovative filtration solutions, often allowing the transfer of existing technology like particle filtration, gas adsorption and ion exchange technology to new applications. Keeping the components of the electric powertrain at the right temperature is essential to ensure battery lifetime. Effective cleaning of liquid coolants for BEV and FCEV from contaminants like particles, water or even ions enables cooling and heating by reducing pump wear, lower the risk of corrosion and electric shorts, and system contamination. As the temperature of battery system cooling plates can be below the dew point, air drying by water vapor adsorption is required to avoid water condensation which might lead to corrosion and electric shorts. In E-Axles, cooling and lubricating loops can be combined to reduce system complexity. Removing fine particles by filtration reduces the risk of wear in the gear. Supplying clean air to the cathode of FCEV-stacks is enabling the reduction of Platinum loads for cost reduction. Separating harmful gases poisoning the fuel cell catalyst with cathode air filters containing tailored adsorber stages reduces the fuel cell system degradation significantly, as shown in research projects. The presentation will describe the need for Filtration & Separation for electrified powertrains based on potential failure modes, and will highlight selected innovative product solutions.