PRESS RELEASE

ElringKlinger fuel cell stacks for logistics centers and ports

- **Supply of three fuel cell stacks in total to be incorporated into various applications by system integrator zepp.solutions**
- **Realized prototype in a Terberg terminal tractor used for container and material handling in ports and logistics centers as well as planned use in water taxi at Port of Rotterdam**
- **More far-reaching collaboration covering supply of additional fuel cell stacks currently under negotiation**

Dettingen/Erms (Germany), October 22, 2020 +++ Fuel cells provide the basis for emission-free propulsion in various fields of application. In those cases in which the requisite hydrogen is produced by wind, solar, or water power, the drive system that relies on such fuel cell technology can be considered completely climate-neutral. In this context, ElringKlinger AG has supplied three fuel cell stacks to Dutch system integrator zepp.solutions B.V. The high power density of ElringKlinger's fuel cell stacks proved a key factor with regard to the selection process and the potential areas of use. On the basis of these stacks, zepp.solutions is capable of developing an extremely compact and highly efficient fuel cell system for various heavy-duty applications.

The first stack supplied by ElringKlinger includes 260 cells and was tested and configured by zepp.solutions on a rig for the purpose of integrating it into fuel cell systems. As a next step, a passive hydrogen recirculation unit was also supplied by the company. Working on this basis, zepp.solutions then fitted its fuel cell system – including ElringKlinger's stack and recirculation unit – to a demonstration vehicle developed by the Dutch manufacturer Terberg Special Vehicles; it is used in a terminal tractor for container and material handling in ports and logistics centers.

A second ElringKlinger stack is to be used in the same area of application following the completion of tests by zepp.solutions with regard to downstream system integration. It, too, is to be deployed in a Terberg terminal tractor used for container and material handling in ports and logistics centers. Additionally, ElringKlinger has provided zepp.solutions with a fuel cell stack with 300 cells, including hydrogen recirculation unit. Subsequent to testing, this unit is to be fitted to a water taxi operated in the port of Rotterdam.

The two parties to the contract are looking to pursue their collaborative efforts based on their accomplishments to date and are currently engaged in negotiations with regard to

additional fuel cell stacks of a new generation, which are to be supplied to zepp.solutions in the coming years for subsequent integration into fuel cell systems.

Fuel cell technology at ElringKlinger

ElringKlinger has been actively pursuing research and development in the area of fuel cell technology for around 20 years and serves the market as both a system and a component supplier. The compact stacks are based on proton-exchange membrane (PEM) technology and convert chemical into electrical energy using hydrogen and oxygen.

Fuel cell stacks are suitable above all for mobile applications with a long range and cyclical operation. Apart from vehicles such as buses and cars, PEMFC stacks can also be used for mobile industrial applications, e.g., in commercial vehicles and fork lift trucks. In addition, the hydrogen-based propulsion unit is also suitable for trains, ships, or aircraft.

ElringKlinger offers stacks in various configurations for integration into customer systems. Stacks with peripheral components and system functionalities integrated into the media module are also available as an option. These features enable considerable simplification and cost reduction with regard to the fuel cell system. In addition to the stack platform, a fuel cell system includes the control unit, the hydrogen pressure regulator, the air filter, the primary cooling circuit, and the power electronics. Interfaces to the customer system include the supply and exhaust air connection, the hydrogen supply at medium pressure level, and the removal of purge hydrogen and product water.

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About ElringKlinger AG

As an automotive supplier, ElringKlinger has become a trusted partner to its customers – with a firm commitment to shaping the future of mobility. Whether optimized combustion engines, high-performance hybrids, or environmentally-friendly battery and fuel cell technology, ElringKlinger provides innovative solutions for all types of drive system. ElringKlinger's lightweighting concepts help to reduce the overall weight of vehicles. As a result, vehicles powered by combustion engines consume less fuel and emit less CO_2, while those equipped with alternative propulsion systems benefit from an extended range. In response to increasingly complex combustion engine technology, the Group also continues to refine and evolve its offering within the area of seals and gaskets in order to meet the highest possible standards. This is complemented by solutions centered around thermal and acoustic shielding technology. Additionally, the Group's portfolio includes products made of the high-performance plastic PTFE, which is also marketed to industries beyond the automotive sector. These efforts are supported by a dedicated workforce of around 10,000 people at 45 ElringKlinger Group locations around the globe.

About zepp.solutions

Zepp.solutions is specialized in the development, integration and control of hydrogen and fuel cell systems. These systems enable the emission-free propulsion and operation of vehicles, or other high power demand applications without any drawbacks on uptime, cost or lifetime. Zepp.solutions also supports your concepts and projects with our consulting and engineering services.