



Global Vehicle Manufacturers Choose BorgWarner's Heater Product Line for New Electric Vehicles

- *High volume programs in Europe and Asia expected to start production in 2020*
- *Thermal management expertise paved the way for two major contracts*
- *BorgWarner strengthens its leading position in the area of electric mobility*

Auburn Hills, Michigan, September 20, 2018 – BorgWarner, a global leader in technology solutions for combustion, hybrid and electric vehicles, has entered into two high volume contracts. The company plans to supply its advanced High-voltage Coolant Heater to one of the leading European automakers and to one of Asia's major vehicle manufacturers, with start of production expected to be in 2020. These awards recognize BorgWarner's vast experience in the field of thermal management solutions for electric vehicles and are another step forward on the journey to a cleaner and more energy efficient world.

"We are excited to offer our compact, lightweight heater innovation for a major European and one of Asia's biggest vehicle manufacturers, helping them to reduce the battery consumption of their electric vehicles while increasing passenger comfort," said Joe Fadool, President and General Manager, BorgWarner Emissions & Thermal Systems. "Our engineers have a vast amount of experience in cabin and battery heating technologies and a deep understanding of the technical requirements of electric and hybrid vehicle manufacturers."

BorgWarner's High-voltage Coolant Heater (HVCH) belongs to the company's Battery and Cabin Heater family. The advanced cabin and battery heater design uses the latest thick film element (TFE) technology and solves two problems in a single device for designers of the fast-growing global fleet of pure electric (EV) and hybrid electric vehicles (HEVs). It helps keep passengers warm in the absence of engine heat and also conditions traction battery packs, allowing them to work at peak efficiency. The technology was developed to meet demand for high performance systems that quickly generate heat. The heat management systems of current and future generations of vehicles are increasingly decoupled from the internal combustion engine, permanently in the case of EVs and for longer parts of the drive cycle in HEVs. As the HVCH's heating elements are immersed in coolant, power losses are minimized. The technology improves

battery energy performance by offering consistent temperature distribution inside the battery pack and its cells. With a high thermal power density and fast response times due to its low thermal mass, the HVCH also extends pure electric driving range as it uses less power from the battery. The technology moreover allows for direct temperature sensing.

The HVCH is available in two versions – single plate and dual plate – both integrated into robust aluminium housings that provide excellent electromagnetic shielding. Single plate devices are responsible for either the thermal management of the battery pack or cabin heating. Dual plate versions manage both tasks at the same time while providing up to 80 percent more heat transfer surface. The HVCH is suitable for applications with supply voltages between 180 and 800 volts and offers a power range of 3 to 10 kW. The devices are protected from overheating, as the system switches off automatically in a case of failure.

About BorgWarner

BorgWarner Inc. (NYSE: BWA) is a global product leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles. With manufacturing and technical facilities in 66 locations in 18 countries, the company employs approximately 29,000 worldwide. For more information, please visit borgwarner.com.



BorgWarner's innovative heater technology was chosen for new electric vehicles of two major global vehicle manufacturers.

BorgWarner Inc. (Global Vehicle Manufacturers Choose BorgWarner's Heater Product Line for New Electric Vehicles _EN) – 3

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