

Abstract Submitted
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Thermoelectric Technology for Automotive Waste Heat Recovery¹ GREGORY MEISNER, GM Global Research and Development — Essential to the long term success of advanced thermoelectric (TE) technology for practical waste heat recovery is fundamental physics and materials research aimed at discovering and understanding new high performance TE materials. Applications of such new materials require their development into efficient and robust TE modules for incorporation into real devices such as a TE generator (TEG) for automotive exhaust gas waste heat recovery. Our work at GM Global R&D includes a continuing investigation of Skutterudite-based material systems and new classes of compounds that have potential for TE applications. To assess and demonstrate the viability of a TEG using state-of-the-art materials and modules, we have designed, fabricated, installed, and integrated a working prototype TEG to recover exhaust gas waste heat from a production test vehicle. Preliminary results provide important data for the operation and validation of the mechanical, thermal, and electrical systems of the TEG in combination with the various vehicle systems (e.g., exhaust bypass valve and controls, thermocouples, gas and coolant flow and pressure sensors, TE voltage and output power). Recent results from our materials research work and our functioning automotive TEG will be presented.

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Gregory Meisner
GM Global Research and Development

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