Southwest Research Institute®

EXHAUST GAS RECIRCULATION (EGR) COOLER TESTING

Government environmental regulations for diesel engine emissions are becoming increasingly stringent, and are driving efforts to develop concepts to reduce emission levels, predominantly for particulate matter (PM) and oxides of nitrogen (NO_x). The use of exhaust gas recirculation (EGR) coolers is considered to be an effective approach to reduce NO_x emissions in order to meet US2007 and US2010 emissions regulations.

Southwest Research Institute® (SwRI®), with more than 50 years of experience in engine, fuel and vehicle research, offers complete facilities for testing diesel engines and their emissions control systems.

CAPABILITIES

SwRI engineers combine state-of-the-art equipment with extensive EGR systems experience to provide engine manufacturers and component suppliers with comprehensive services, including:

- ❏ Test stands that provide thermal cycling of exhaust gas to induce thermal fatigue of the EGR cooler
- ❏ Fouling of the EGR cooler and its long-term effects on thermal efficiency
- ❏ Accelerated corrosion testing of the EGR cooler
- ❏ EGR cooler hot vibration testing to simulate real-world EGR system vibration during the vehicle lifetime
- ❏ Metallurgical evaluation of EGR cooler components

FACILITIES & EQUIPMENT

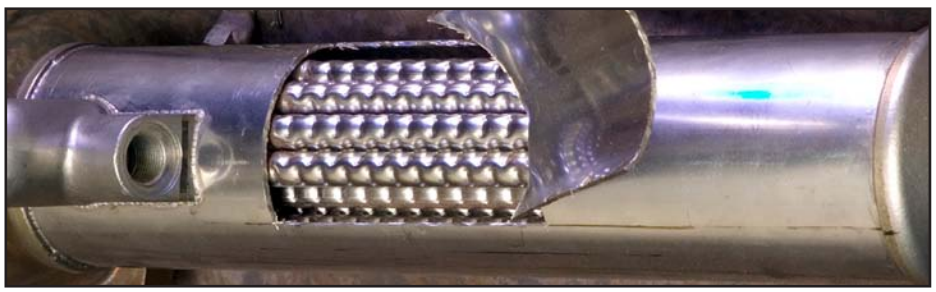
SwRI testing facilities for EGR coolers are capable of:

- ❏ Testing up to four coolers simultaneously (depending on gas flow rate needs)
- ❏ Laboratory operations up to 24 hours per day
- ❏ Balanced gas and coolant flow rate for each cooler
- ❏ Data logger to record inlet/outlet temperatures, pressures, and coolant flow rates for each cooler
- ❏ Custom cycle development to meet client needs

ASSESSMENT OF EGR COOLER FOULING EFFECTS

SwRI has extensive experience with testing the effects of EGR cooler fouling. Capabilities in this application include:

- ❏ Using particulate matter (PM) size and number distribution measurements to determine PM deposition rates inside the cooler
- ❏ Determining engine modes of operation that contribute to accelerated fouling of the EGR cooler
- ❏ Testing EGR cooler fouling under different operating conditions and aftertreatment system configurations
- ❏ Determining solutions to minimize EGR cooler fouling



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Heavy-duty EGR gas cooler prepared for inspection

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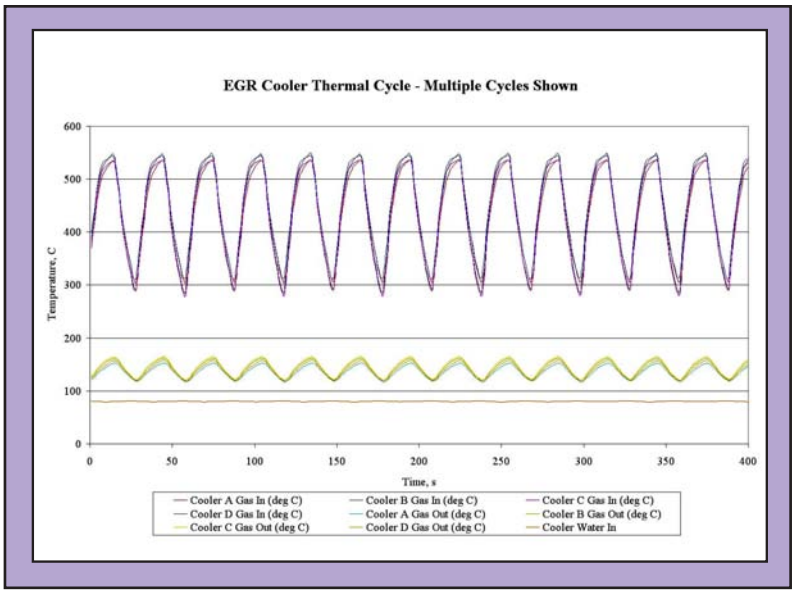
Accelerated EGR cooler thermal cycle durability testing for engine manufacturers and component suppliers



Example of an EGR cooler thermal cycle developed at SwRI

Southwest Research Institute is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies more than 1,200 acres in San Antonio, Texas, and provides nearly two million square feet of laboratories, test facilities, workshops, and offices for more than 3,000 employees who perform contract work for industry and government clients.

We welcome your inquiries.
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