



# Electric Component Laboratory



GSPEL Laboratory

GVSC's Ground System Power and Energy Laboratory (GSPEL) Team operates the Electric Component Laboratory (ECL) which supports research, development, characterization and testing of high-voltage, high power components necessary for military vehicle electrification and hybrid-electric technology. This lab's research extends to a testing cell in the Propulsion Laboratory that has programmable power absorption and supply capabilities with voltage, current and power, and controls a 350-horsepower AC dynamometer. Component testing on vehicle is also available. The ECL provides temperature and humidity controlled environments, as well as 346kW and 373kW AC dynamometers to fully test various components.

## Benefits

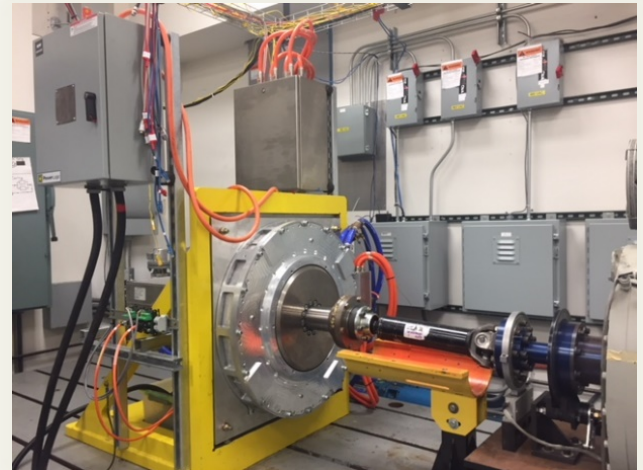
The ECL offers several benefits:

- Testing of high voltage, high power components
- Analyze future electrical power generation and control technologies for the Army
- Provides power quality, transients, and harmonic distortion
- Variable coolant temperature and flow rate over a large range
- (Future) Certified and accredited testing to ISO17025
- Thermal chamber for component level testing
- MIL-PRF-GCS600 testing
- Resistive and Capacitive load banks to simulate a wide variety of load types
- Pressure testing of coolant cooled components using high sensitivity pressure transducers

## Components Tested

The ECL can test multiple types of components:

- Advanced Electric Machines
- High Voltage Alternators
- Motor controllers
- Power Inverters
- DC/DC Converters



*160kW Integrated Starter Generator*



*SiC Inverter*

## Capabilities

### ECL Dynamometer

- 373kW 4Q AC Dynamometer
- 3,321 Nm torque from 0-1000rpm
- 0 – 12,000 rpm speed range

### CELL 10 Dynamometer

- 346kW 4Q AC Dynamometer
- 1,245Nm torque from 0-2000rpm
- 0 – 12,000 rpm speed range

### Thermal Chamber

- Temperature range of -30 to +177 C
- Humidity range of 10% to 95% RH, 85C Max temp and 4C minimum dewpoint
- 439 Liter capacity

### AV-900 250kW Dual Power Supply

- Voltage: 8 to 900V
- Current: +/- 1000 ADC
- Power: +/- 250kW

### AC and DC Load Banks

- Up to 250kW power absorption

### Acquisition of mechanical and electrical parameters

- Phase to Phase measurements
- Active, apparent and reactive power
- Mechanical power
- Power factor and efficiency
- Fundamental frequency
- Total Harmonic Distortion
- Voltage & Current Transients
- Cooling characteristics; Thermal, pressure, flow rate



*AC Dynamometer*



*Power Cycling Station*



*250kW Resistive Load Bank*