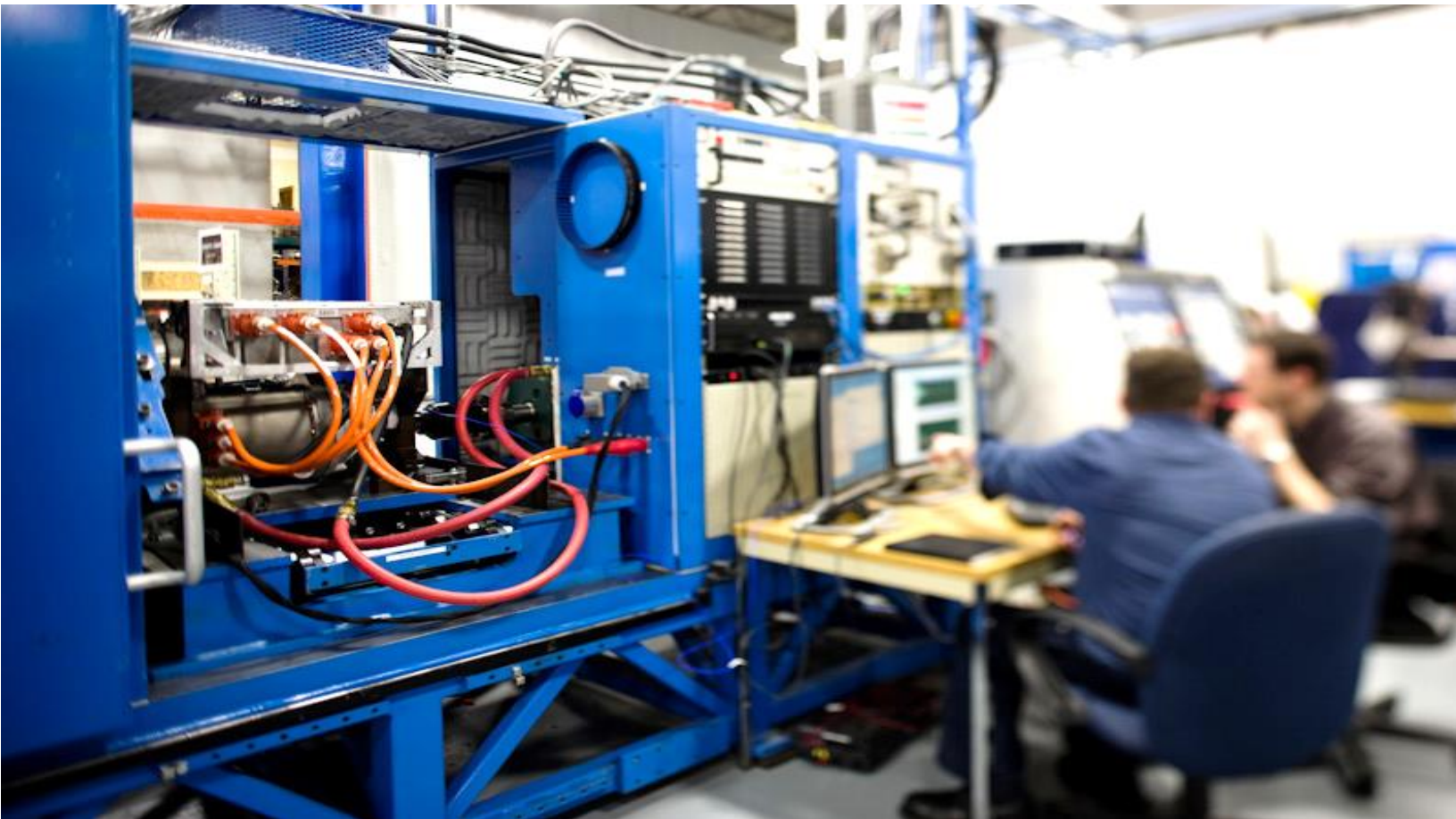


A WEALTH OF FACILITIES

TM4 has a 400 m² testing area dedicated to the full validation and certification of its electric motors, generators and power electronics.



BASIC FEATURES:

- Dual Monitor Display
- Torque Mapping Feature
- Spread Sheet Type Test Scheduler
- Fully Automated Operation
- Multiple Communication Drivers
- Facility Interface Module
- High Speed Data Acquisition
- Real Time Control & Data Acquisition

COMMUNICATION PROTOCOLS :

- CAN
- RS232
- Analog and Digital
- Ethernet
- GPIB
- RS422/485
- Others available on request

UP TO ANY CHALLENGE

State of the art equipment is available to assist, test and validate any type of electric motor.



CAPABILITIES :

- 0-18 000 RPM
- 0-5370 Nm
- Transient Torque & Speed Response
- Road load simulation
- Battery Simulation
- Real Time Simulation
- Inertia Simulation
- Cooling Options (water, glycol, air)

TEST PERFORMED AT TM4 :

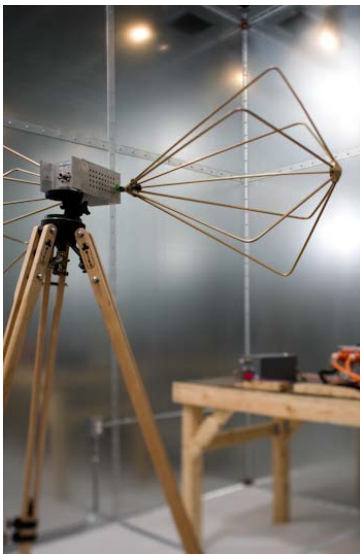
- Efficiency
- Characterization
- Durability
- Transient Response
- Thermal Runs
- Model Verification & Analysis
- Open and lock Differential
- Pre-Compliance EMI
- Vibration
- Mechanical shock collision
- Thermal aging, immersion protection

FEATURES

- Complete mechanical print details
- Regenerative AC systems
- 24 Hour Emergency Service
- Extensive knowledge in the areas of electric and hybrid powertrains

REFERENCES

- Novabus
- Tata Motors
- PSA Peugeot Citroën
- BRP
- Volvo Trucks
- And many more





OTHER AREAS

Battery Simulators:

- 8-900VDC common bus on primary DC to DC inverter
- 1000ADC continuous
- 250 kW DC

PZ 4000 Power analyzer & WT 1600 Power meter:

- 3 Phase Currents
- 3 Phase Voltage
- Frequency
- DC voltage and Current,
- Torque
- Speed
- Power factor
- Motor and Drive efficiency

COMPLETE LISTING

- 7 Test cells with overhead crane, air-conditioned
- Separate air-conditioned control rooms for each test cell
- 9 Dynamometers (60-670 kW) 4 quadrant operation
 - Type 1 Wheel shaft 2x 30kW 0-1500RPM (qty 4)
 - Type 2 Drive shaft 150kW 0-5000RPM
 - Type 3 Drive shaft 75kW 0-5000RPM
 - Type 4 Drive shaft 120kW 0-18000RPM
 - Type 5 Drive shaft 670kW 0-2000RPM
 - Type 6 Drive shaft 220kW 0-12000RPM
 - Type 7 Drive shaft 132kW 0-6000RPM
- Water cooling systems
 - Chiller 5kW 15 to 80oC (qty 2)
 - Chiller 10kW 5 to 80oC (qty 7)
 - Chiller 20kW 5 to 80oC
 - Chiller 20kW -15 to 90oC
 - Chiller 5kW -40 to 60oC
- Instrumentation
 - Torquemeter and speed 500Nm, 1000Nm, 10kNm, 0.05%
 - Flowmeter
 - Data acquisition system (thermocouple, 4-20mA, etc.)
 - Power meter
 - Accelerometer
 - Ventilator to emulate the windage
 - Video recordings
 - Infrared thermal camera
- DC Power supply
 - Battery simulator 8-600Vdc ± 600 Adc ± 160 kW, 1 or 2 channels (qty 2)
 - Battery simulator 8-900Vdc ± 1000 Adc ± 250 kW, 1 or 2 channels
 - Battery simulator 8-420Vdc ± 530 Adc ± 150 kW, 1 or 2 channels (qty 2)
 - Power supply 0-500Vdc 400Adc 200kW
 - Power supply 0-750Vdc 600Adc 150kW
 - Power supply 0-750Vdc 300Adc 75kW
 - Power supply 0-500Vdc 90Adc 45kW
- Electrical Load Bank: RL 150kW, RL 80kW
- 2 Environmental chamber: -70 to 180°C, humidity, 10cu ft & 42 cu ft, 2500CFM airflow
- Pre-compliance EMI/EMC in house tests capabilities
 - Radiated Emission test (ex. CISPR 25)
 - Conducted Emission test (ex. CISPR 25)
 - Electrical disturbance test (ex. ISO 7637-2, ISO 16750-2, etc.)
 - Electrostatic discharge test (ex. ISO 10605)
- Vibration table 17600 lbf
- Pneumatic shock machine