

CASE STUDY:

Arctic Test Centre: Extreme-temperature Testing



Date: July 2021

PAMI's Capabilities:

- *Third-party independent testing.*
- *Technical expertise to support the agriculture, mining, and transportation industries.*
- *ISO 9001:2015-registered organization.*
- *Able to meet the strict requirements of a wide range of testing standards.*
- *Access to highly accurate and calibrated data acquisition equipment.*
- *Technical report writers (manuals, parts books, engineering reports).*

Client's Challenge:

How well does my product, component, vehicle/equipment structure or process perform under extreme cold or hot temperatures?



Project Scope:

PAMI's extreme-temperature environmental chambers can be used to complete

- testing of large equipment or components under extremely high or low temperatures,
- cold-start tests on diesel and gas engines,
- material durability and flexibility testing under cold temperatures,
- cab heating and air-conditioning tests (e.g., SAE Standard J1503),
- defogging (e.g., SAE J953) and windshield defrost tests (e.g., SAE Standard J381),
- product conditioning and material handling under extreme temperatures, and
- ROPS tests (e.g., CSA Standard B352.0 or ISO 3471).

Environmental Chamber Specifications:

- **Dimensions:** 16.5m long x 5.7m wide x 5.5m high (Door: 4.3m wide x 4.9m high).
- **Mechanical specifications:**
 - Multi-stage refrigeration systems capable of achieving -40°C (-40°F).
 - Additional available cooling capacity to handle up to 185 kW heat loads while still maintaining -40°C (-40°F).
 - Heating equipment capable of achieving +40°C (104°F; or warmer if necessary).
- **Capacity:** Can accommodate commercial buses, ambulances, agricultural equipment, and other large industrial equipment.
- **Controls:** Computerized control of chamber temperature and humidity, including programmable setpoints with scheduled ramping.

Value Created:

- **Timely Results:** Fast results due to year-round access to extreme-temperature testing. PAMI's combination of facilities, knowledge, and experience also allows work to be performed quickly while maintaining thoroughness and accuracy.
- **Product Confidence:** Data collected at temperature extremes can prove useful during the product development cycle.
- **Quality:** PAMI operates under an ISO 9001:2015 quality system and maintains complete test and certification records.
- **Confidentiality:** PAMI maintains strict confidentiality of your designs, products, and test results. You retain all intellectual property.
- **Validation:** PAMI can act as an independent third-party testing entity to validate your equipment and products.