



Canmet Canadian Explosives Research Laboratory

Science in Support of Explosives Safety and Security

CanmetCERL, Ottawa, Ontario, Canada

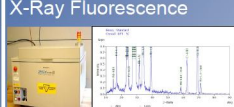
CHNOS Elemental Analyzer



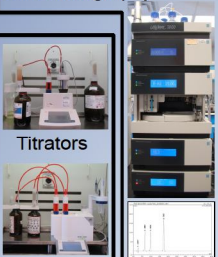
Scanning Electron Microscopy Energy-dispersive X-ray Fluorescence detector



Wavelength Dispersive X-Ray Fluorescence



High Performance Liquid Chromatography



Inductively Coupled Plasma- Optical Emission Spectrometer



Titration

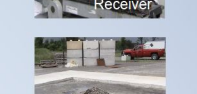


Helium Pycnometer



- Conduct chemical analyses on explosive products submitted for authorization and continuing authorization testing.
- Provide analytical support to internal or external clients.
- Assist with the physical testing of explosives.
- Characterization of a wide variety of energetic materials including improvised explosives.

Explosive Analysis

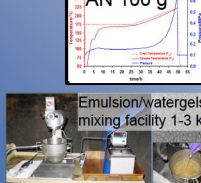
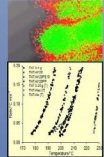
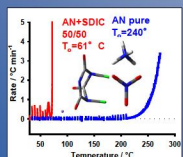
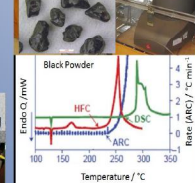
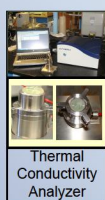
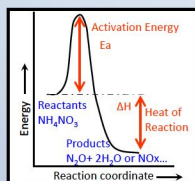


Explosive Certification

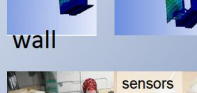
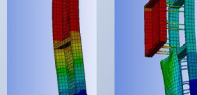
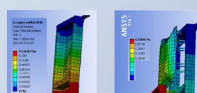
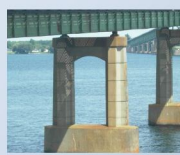
- Mandated work in support of the **Explosives Act**
- Approx. 150-200 samples tested per year; fireworks / blasting explosives / ammunition & propellant.
- CERL recommends authorization if product meets Canadian standard. Continuing authorization program revamped in 2011 to ensure previously authorized products still meet regulations
- UN TDG authorization / classification testing results accepted by international partners
- Ballistic resistance of armour and related materials to AEP-55 NATO Level 4 and other materials to NIJ, EN and MIL standards
- Testing of explosive substances including stability, sensitivity, and performance (velocity of detonation). Testing of pyrotechnic articles (recue devices, signals, simulators, etc.).
- Gap tests, internal ignition tests, DDT tests, vented pipe tests, time-pressure (closed bomb) tests, Könen (aggressive external heating) tests. Tests for oxidizers and flammable solids. Test for self-reactive materials and organic peroxide
- Radiography of explosive articles

- Improve the level of safety for clients and partners by characterizing process hazards.
- Develop new tests and contribute to standards.
- Literature search / in-house database on energetic materials.
- Characterization of the thermal decomposition, combustion / detonation properties, sensitivity and stability of energetic materials and unstable substances.
- Compatibility of energetic materials with process chemicals and plant materials.
- Internal research i.e., thermal hazards of catalysts used in biodiesel production, Al nanopowder technology for energetic materials.

Explosives Research



Explosion Effects



- Measurement and modelling of blast effects.
- Vulnerability assessments of key government and public infrastructure such as bridges, pipelines, buildings (National Standard for Building Protection Against Blast, Integrated Risk Assessment Methodologies).
- Tests to evaluate performance of commercial products.
- Development of containers for explosives transport / bomb disposal (Consolidated Assessment of Threats for the Transport of Combustible Liquid/Gaseous Fuels (FAE)).
- Demonstration of magazine safety to support Q/D requirement.
- Internal research, i.e., blast effects, sensor characterization etc.

