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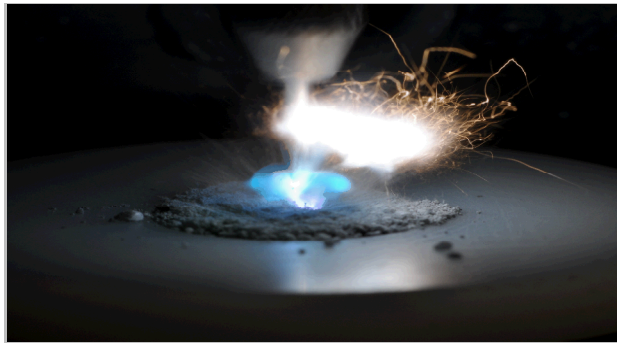

Small-scale Sensitivity Testing (SSST) Laboratory

An Overview of the SSST Facility Capabilities

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U.S. DEPARTMENT OF ENERGY | NNSA

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Sensitivity Testing

- Explosives are subjected to various stimuli through normal handling and use.
- These hazards must be assessed in order to perform work safely with these materials.
- Once evaluated, these hazards can be mitigated with proper procedures or equipment.
- In the SSST Laboratory, tests are available to evaluate the following hazards:

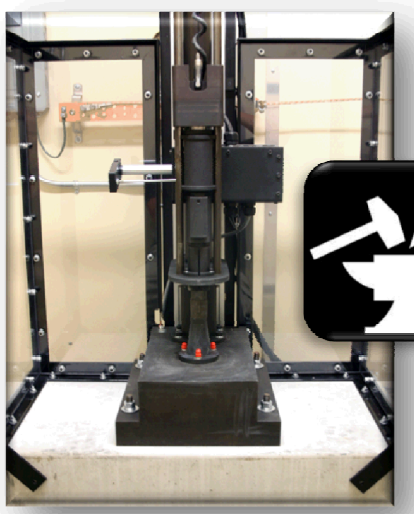
Impact

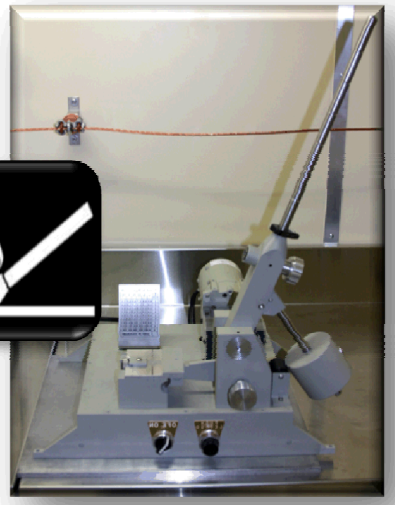
Friction

ESD

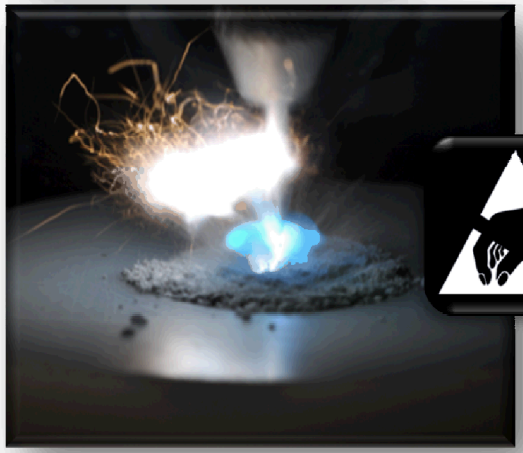
Thermal

Small-Scale Sensitivity Testing Lab





SSST Options



Explosive Material Hazards

Impact

May occur during:
- Handling
- Mixing
- Transportation

Friction

May occur during:
- Handling
- Mixing
- Transportation
- Pressing/machining

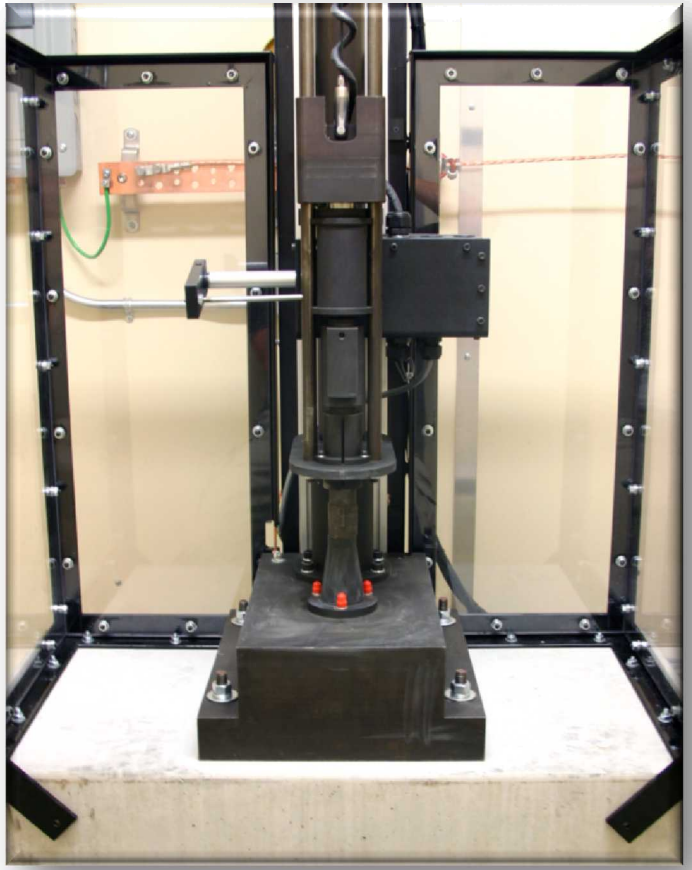
ESD

May occur during:
- Handling
- Mixing
- Transportation

Thermal

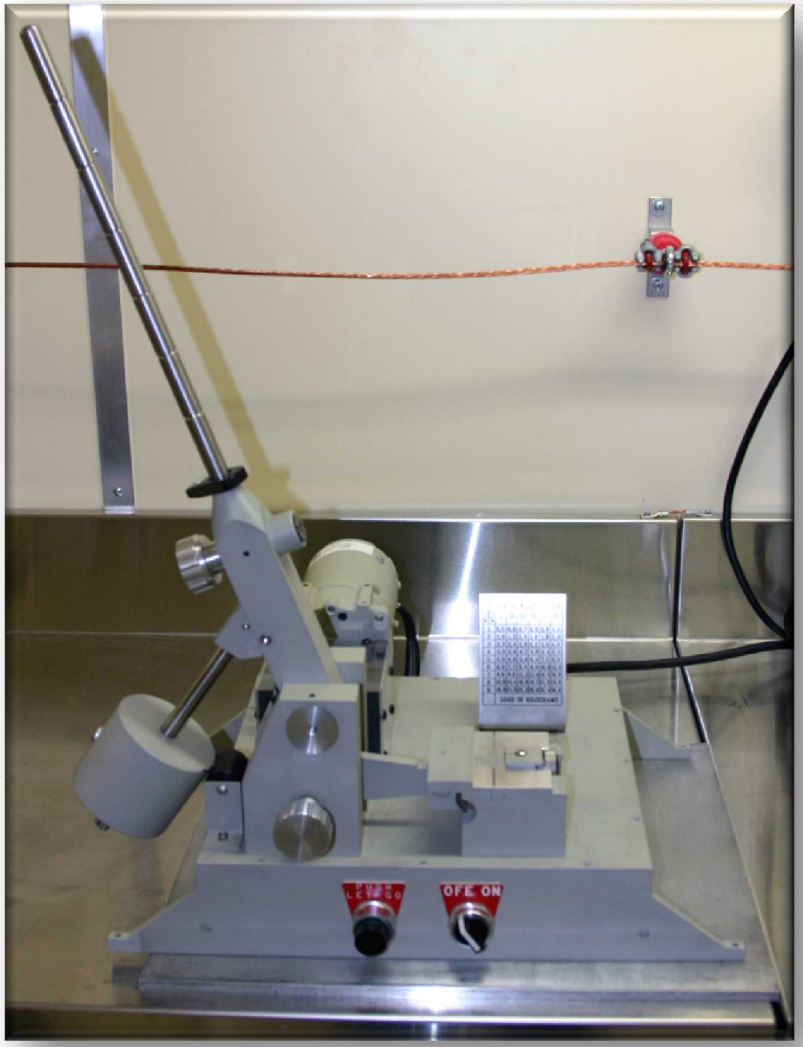
May occur during:
- Synthesis
- Mixing
- Transportation
- Storage

Impact Testing



- Test types available:
  - Type 12A,B - UN Series 3(a)(v)
  - BOE - UN Series 3(a)(i)
  - MBOM (Modified Bureau of Mines)
- Up to 115cm drop height with 1-5kg masses.

Friction Testing



- Test Type - UN Series 3(b)(i)
- 0.5 – 36.0 kg of normal force
- Utilizes disposable porcelain pins and plates

Electrostatic Discharge (ESD) Testing

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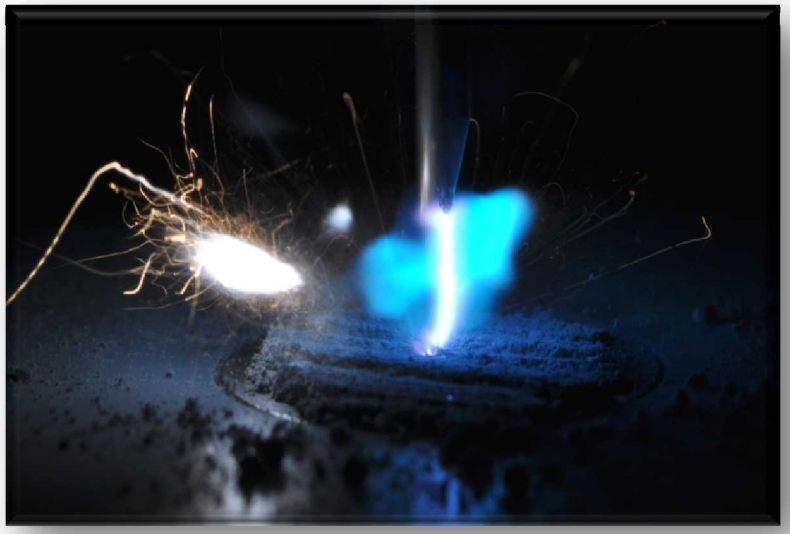
- Allegany Ballistics Laboratory (ABL) Machine
- 9.375 - 0.0025 Joules at 5kV, typical test range
- Approaching or fixed needle testing
- CO/CO_2 gas analyzer available for material response detection

ESD Camera Detection System

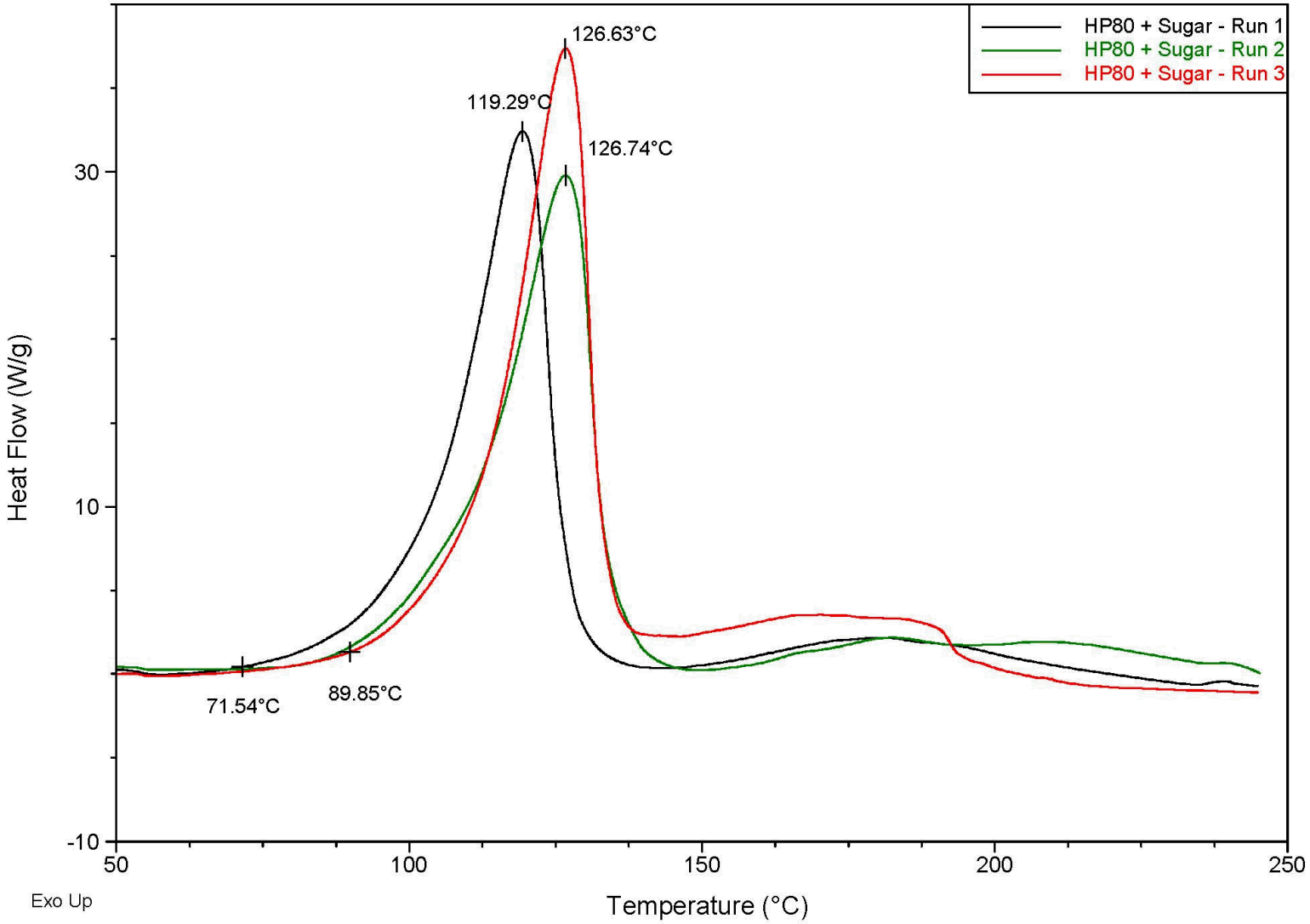


- Used to enhance interpretation of material response
- Provides a photographic record of each test shot
- Used in conjunction with or in place of the gas analyzer

Thermal Analysis

- Differential Scanning Calorimeter (DSC)
- Shows a material's response to ramping temperature
- Can detect phase/glass transitions as well as endo/exothermic reactions

DSC Thermal Analysis Output



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