University of Dayton Research Institute

FIRE TESTING & FIRE SAFE MATERIAL DEVELOPMENT

SERVICES

We provide standard and customized testing services to understand how materials behave in fires via fundamental and applied measurement techniques. We work with customers to help them understand the data relevant for their end-use goals.

MATERIALS FIRE TESTING CAPABILITIES

CUSTOM TESTING SOLUTIONS

- Use and modification of regulatory tests of military fire safety and survivability
- Experience with Army, Navy, and Federal Aviation fire safety standards
- Experience with all civilian fire safety standards
- Consulting on material and regulatory fire test applications and fire risk scenarios
- Custom fire testing needs for scientific and material development needs
- Over 26 years experience

TEST EQUIPMENT AVAILABLE

CONE CALORIMETER – ASTM E-1354

CUSTOM TESTING SOLUTIONS

- Measures heat release rate by oxygen consumption calorimetry
- Measures mass loss rate, smoke production rates, CO/CO_2 production rates
- Standard test for fundamental understanding of materials fire behavior

MICRO COMBUSTION CALORIMETER

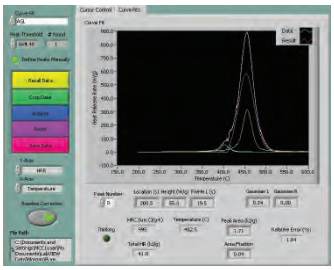
PYROLYSIS COMBUSTION FLOW CALORIMETER

- Small scale quantitative flammability testing apparatus (5-50 mg sample) enabling rapid screening for flammability performance
- Materials can be pyrolized under air or nitrogen at rates of 1°C/sec from 50°C to 900°C

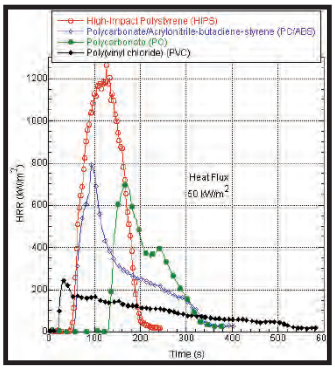
The Fire Safety Science Laboratory (FSSL) is certified to ISO 9001: 2015 (Eagle Certification Group, Cert No. 5587).

FLAME RETARDANT RESEARCH CAPABILITIES

- Flame retardant and flame retardant material design for regulatory tests and fire risk scenarios
- Experience with military fire safety/survivability needs
- Experience with all types of flame retardant additives, chemicals, and approaches
- Literature searches for patent and proposal writing
- Consulting on material selection for fire safety needs
- Fire science / fire safety engineering
- Custom formulation and material development
- Test plan development
- Over 26 years experience



Heat release capacity results for high-impact polystyrene sample



Heat release rate curves for common thermoplastics

FIRE & HEAT RELEASE TESTING CAPABILITIES

- **Cone Calorimeter**
  ASTM E1354, D6113, E1740, F1550, E1474, IS05660
- **Micro Combustion Calorimeter**
  ASTM D7309
- **UL-94**
  ASTM D635, D3801, D4804, D5048, D4986
- **Horizontal Flammability Tester**
  ASTM D5132, FMVSS 302
- **Vertical Flammability Tester**
  FAA 60 second vertical burn
- FAA Multi Tester:
  Vertical (12 & 60 seconds flame exposures), Horizontal, 45 degree, 60 degree Bunsen burner tests
- **Oxygen Bomb Calorimeter**
  ASTM D240, E711, D480

FIRE TESTING EXPERIENCE

- Textile and uniforms
- Furniture and Furniture Components
- Wire and cable
- Electronics
- Batteries/Electrical Systems
- Composites (ground, maritime, aerospace)
- Tires and track components
- Building materials
- Wood and natural materials
- Plastics
- Large Fire Tests

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