

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need: Developing Tools for Evaluation of Fuel Characteristics

Describe the need:

The characteristic of fuels mainly used by fire investigators today is ignition temperature. These temperatures are published for many fuels in a variety of sources. Often the temperature is reported as a discrete number. In evaluating fire cause fire investigators often misapply the concept of ignition temperature when evaluating the viability of a fuel given a known heat source. Ignition temperature, however, is less important when evaluating ignition source or fuel competency than critical heat flux. This is a concept with which many investigators need to become more conversant. Heat release rates of common materials and fuel packages are required to support fire growth analysis. Fuel characteristics need to be cataloged and reported in a way that can be used validly by fire investigators. This research need is for the development of practical tools that can be used by the fire investigator to evaluate fuel characteristics and the performance of fuels under fire conditions in support of understanding fire growth as it relates to the determination of origin.

Keyword(s): Fuel characteristics, heat release rates, ignition temperature, ignition energy, fire growth

Submitting subcommittee(s): Fire & Explosion Investigation **Date Approved:** March 10, 2021

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

Yes. NFPA 921 does not address this topic in the level of detail needed for fire investigators to use appropriately in the analysis of the growth and spread of fires.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

Yes. The UL Firefighter Safety Research Institute conduct a study in the fall of 2020 comparing natural and synthetic furnishings on the time to flashover.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

N/A

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

Yes.

5. In what ways would the research results improve current laboratory capabilities?

This research need is targeted to improve current fire investigation field work rather than laboratory analyses. This research will serve to better inform fire investigators as to how fuel properties impact the growth and spread of fire.

6. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

See Number 5.

7. In what ways would the research results improve services to the criminal justice system?

This research will help the fire investigation community to better analyze fire growth and spread and improve their ability to determine the origin of a fire.

8. Status assessment (I, II, III, or IV):

II

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.