



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

PROJECT SUMMARY

Influence of wood particulate size and moisture content on deflagration hazard

4 October 2018

Background: For many revision cycles NFPA 664 Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities, has used a median particle size to distinguish between particulates that should be considered a potential deflagration hazard from those that can be safely assumed to not pose an explosion hazard. With a numerical median size criterion in the standard, a physical inspection can be employed to identify which portions of the process stream represent a potentially hazardous condition and which do not. The standard defines “deflagrable wood dust” on the basis of mass median particle size and moisture content. This makes the standard much easier and less-costly to use. Question has been raised over the suitability of both the numerical value of the mass median particle size and the moisture content. The other dust standards rely entirely on dust testing in accordance with ASTM E 1226 with no explicitly identified gross physical parameter quantified. Consequently, one cannot know if a particulate is hazardous without testing it. But the test method relies upon modifying the particulate to accommodate the test apparatus. This can result in the overstatement of the hazard in some cases. It can also result in circumstances where the particulate is impossible to test in the current ASTM method and no conclusion is achievable. In that case compliance with the requirements of the standard becomes impossible. Naturally, this situation erodes the confidence in the standard as a whole.

Research Goal: The overall goal of this project is to develop a data set from published literature that may provide basis for substantiating mass median particle size and moisture content criterion for distinguishing wood particulates that are extremely unlikely to pose a deflagration hazard from those that should be submitted for testing.

Project Tasks:

This project is comprised of the following tasks:

1. Conduct a literature review to collect data about particle median size and moisture content of wood particulates.
2. Analyze and relate the above data to deflagration hazard posed by the wood particulates.
3. Provide a technical basis of the current criterion in the NFPA 664 standard.
4. If the literature review does not substantiate the current criterion, propose an experimental test plan in accordance with ASTM E 1226 to identify a mass-median particle size and moisture content for wood particulates where the potential for deflagration is sufficiently low to justify considering the particulate only a fire hazard without the necessity of further testing.
5. Submit a final report based on findings from all the above tasks.

Implementation: This research program will be conducted under the auspices of the Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel of industry

stakeholders who will provide input to the project, recommend contractor selection, review periodic reports of progress and research results, and review the final project report.

Tentative Schedule:

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| Project Kick-off meeting: | 15 October 2018 |
| Interim Task 1, 2 & 3 update: | 15 December 2018 |
| Draft Final Report: | 25 January 2019 |
| Final Report: | 25 February 2019 |

About us:

About the Fire Protection Research Foundation

The [Fire Protection Research Foundation](#) plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.



About the National Fire Protection Association (NFPA)

Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. [All NFPA codes and standards can be viewed online for free.](#) NFPA's [membership](#) totals more than 65,000 individuals around the world.

