



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

STUDENT PROJECT PROSPECTUS

The Effects of Signage Materials Applied to Swinging Fire Doors

7 July 2020

Background: The NFPA Technical Committee on Fire Doors and Windows (FDW-AAA) is seeking technical substantiation on the requirements for signage on fire doors in 2019 edition (and previous editions) of NFPA 80, Standard for Fire Doors and Other Opening Protectives to justify either maintaining current requirements or modifying the requirements in NFPA 80. Section 4.1.4 contains a provision for larger signage applied to fire doors to be "...in accordance with the manufacturer's published listing." It is unclear whether this provision refers to the listings of the door manufacturer or the signage manufacturer. Section 4.1.4 of NFPA 80 (2019) limits the size of informational signage to not more than "...5% of the area of the face of the fire door..."; making this requirement subjective to the size of the doors to which the signage is attached. NFPA 80 is silent as to the materials (e.g., plastic laminates, aluminum, steel, paper, vinyl, and wood) used for signage, construction of the door leaves (e.g., hollow metal or wood composite), level of fire protection rating (e.g., 20-minute up to and including 3-hour), or temperature rise-rated core materials. The term "signage" is undefined in NFPA 80 and is therefore subjective to the interpretation of the persons inspecting the doors.

Research Goal: The overall goal of this project is to identify technical substantiation on the requirements for signage on fire doors in NFPA 80, Standard for Fire Doors and Opening Protectives, through a literature review.

Project Tasks:

1. **Task 1. Literature review:** Conduct a literature review to verify if there are any justifications and technical substantiations on the fire door signage requirements in NFPA 80 (2019 edition). This should also summarize the history of NFPA 80 fire door signage requirements.
2. **Task 2. Engineering Evaluation:** Evaluate the effect of type of signage materials, photoluminescent markings, fire door rating, door construction on the performance of fire doors in the event of fire. It might be possible for to perform engineering evaluations based on existing data to determine which signage materials might have detrimental effects on the doors. For instance:
 - a. Do signage materials applied to 20-minute rated doors (of any construction) create conditions that compromise their ability to perform as intended?
 - b. If the doors of any level of fire rating are also temperature rise-rated, does the application of signage materials negatively affect their performance?
 - c. If the doors are flush (i.e., without vision light kits) do applied signage materials create hazardous conditions?
 - d. Are photoluminescent markings considered signage and do they affect the performance of the fire doors?
 - e. Consider the effect of radiative heat transfer to the unexposed side of the fire door in the event of fire.
3. **Task 3: Final report:** Prepare a final report of all findings and finalize it after reviewing with the project panel.

How this information will be used: Project deliverables will be useful for NFPA 80 Technical Committee.