

# EXECUTIVE SUMMARY

## Objectives

The overall objective of the project is to develop a set of flammability data for a group of commonly used aqueous liquids that may exhibit a flash point, with a particular emphasis on supporting a low fire hazard designation for certain kinds of liquid (in consideration of NFPA 30).

Phase 1 of the project consists of small scale testing of representative aqueous solutions of polar solvents in order to develop a proposed classification scheme based on performance in the tests, and to develop a full-scale validation test plan. It must be emphasised that any proposed classification scheme based on small-scale testing will require validation, through full-scale testing, before it could be reliably used.

## Summary

Thirty aqueous blends of flammable / combustible solvents were selected and subjected to small scale testing: flash point, fire point and cone calorimetry. The data reveals that the fire behaviour of these solutions can be complex. However, a number of “strawman” criteria have been proposed for the identification of those blends considered to present a low fire hazard. These are :

- i) No flash to the onset of boiling in closed cup flash point testing;
- ii) Time to ignition of solution greater than typical sprinkler activation time, suggest > 20 seconds;
- iii) Low maximum *rate of heat release* in cone calorimetry tests (in comparison to a typical NFPA Class III commodity, such as wood or cardboard, of a similar thickness); suggest < 250 kW/m<sup>2</sup>;
- iv) FPI > 0.08 m<sup>2</sup> s/kW (based on a time to ignition of < 20 seconds and a maximum rate of heat release of < 250 kW/m<sup>2</sup>);
- v) Low *total heat release* per m<sup>2</sup> in cone calorimetry tests (in comparison to a typical NFPA Class III commodity, such as wood or cardboard, of a similar thickness); suggest < 100 MJ/m<sup>2</sup>.

## Recommendations

Large scale fire testing should be carried out both to evaluate the validity of the “strawman” criteria and to develop understanding of the fundamental phenomena that characterise the fire hazard.

Details of the proposed validation testing will be reported separately.