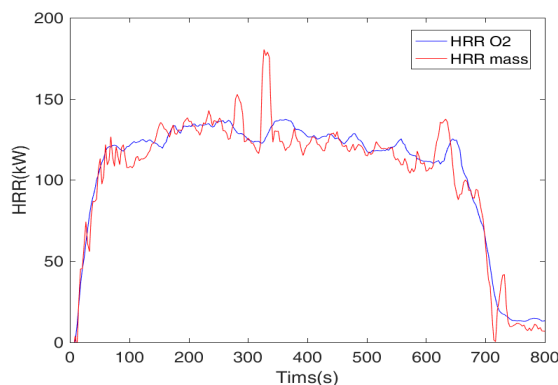


NUREG 1805 application

1. Compartment: 5 m by 4 m by 3 m(H), Vent width: 2 m, Vent height: 1 m, Top of vent from floor: 2 m, T_{amb} : 25°C, HRR: 1 MW
 - Case 1: for the interior lining of 1.5 cm thick gypsum board
 - Case 2: for the interior lining of 15 cm thick concrete.
- a. Compare the upper gas layer Temp. for case 1 and case 2 by plotting the two temperature data in one chart.
- b. Assuming no opening exists in the compartment, what would be the amounts of the mechanical ventilation to result in the same upper gas layer Temps at 60 min for each case?
- c. With no openings in the compartment, what would be the upper gas layer temperatures after 30 min? Are the results reasonable? Why or why not?
2. Using the NUREG 1805 spreadsheet,
 - a. calculate the heat release rate of heptane in a 0.3 m by 0.3 m pan and the amount (Liter) of heptane to burn for 4 minutes.
 - b. What is the flame height calculated? Note that figure below shows the HRR curve of heptane in a 0.3 m by 0.3m pan.



- c. Calculate the HRR and flame height using the correlation based on the lecture notes.
3. Repeat question #2 and #3 for 5 m by 5m heptane pan fire. if there is any difference between hand calc. and the NUREG, why?
4. What would be the maximum dike size in diameter that does not ignite the target which is 10 m away from the fire? Assume 20 kW/m² as a minimum ignition heat flux and heptane release from a storage tank.