

HW7_after burning rate 2

Due Nov 9 at 1:59pm

Points 9

Questions 5

Time Limit None

Allowed Attempts 3

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	6,013 minutes	9 out of 9

! Correct answers are hidden.

Score for this attempt: 9 out of 9
Submitted Nov 9 at 12:18am
This attempt took 6,013 minutes.

Question 1

5 / 5 pts

From the experiment in the lab that we conducted, the following data were obtained. What is the maximum flame spread rate in mm/s?

Round your answer to the first decimal place and do not include any unit.

Distance (mm)	0	20	40	60	80	100	120	140	160	180
Time to reach(s)	0	2	4	7.2	9.2	10.8	12.8	14.8	16.4	18.4

12.5

Question 2**1 / 1 pts**

The bottom half of a vertically oriented 0.4 m long, 0.1 m wide, 2 mm thick plywood (thermally thick) was exposed to heat flux of 60 kW/m². It was ignited at 5 s. The 60 kW/m² heat source was removed after ignition and uniform heat flux of 20 kW/m² was applied to the surface from a 0.3 m tall flame from the bottom of the plywood. Calculate the upward fire spread rate with the following properties.

Density = 540 kg/m³, thermal conductivity = 0.12 W/m-K, specific heat = 2.5 kJ/kg-K. Initial temperature = 20 °C with total radiative and convective heat transfer coefficient is 20 W/m²-K. $T_s=120$ °C.

☐ 9 mm/s

☒ 4 mm/s

☐ 2 mm/s

☐ 7 mm/s

Question 3**1 / 1 pts**

A 100 gallon of heptane is suddenly released from a storage tank to a 1.6 m by 2 m dike. Calculate the fuel burning rate in kg/s from the dike. Below are the heptane properties.

- Heat of combustion of heptane = 44.6 [kJ/g]
- Mass burning rate per unit area for infinite diameter = 0.101 [kg/m²-s]
- Extinction coefficient multiplied by the mean beam length corrector = 1.1 [1/m]
- Density = 675 [kg/m³]

☐ 0.09

☒ 0.29

☐ 0.23

☐ 0.07

Question 4

1 / 1 pts

A 100 gallon of heptane is suddenly released from a storage tank to a 1.6 m by 2 m dike. Calculate the total burning period in seconds from the dike. Below are the heptane properties.

- Heat of combustion of heptane = 44.6 [kJ/g]
- Mass burning rate per unit area for infinite diameter = 0.101 [kg/m²-s]
- Extinction coefficient multiplied by the mean beam length corrector = 1.1 [1/m]
- Density = 675 [kg/m³]

☐ 3550

☒ 890

☐ 3250

☐ 960

Question 5

1 / 1 pts

A 100 gallon of heptane is suddenly released from a storage tank to a 1.6 m by 2 m dike. Calculate the heat release rate in kW from the dike. Below are the heptane properties.

- Heat of combustion of heptane = 44.6 [kJ/g]

- Mass burning rate per unit area for infinite diameter = 0.101 [kg/m²-s]
- Extinction coefficient multiplied by the mean beam length corrector = 1.1 [1/m]
- Density = 675 [kg/m³]

☐ 3960

☒ 12820

☐ 3200

☐ 12630

Quiz Score: **9** out of 9